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EMRS TGT LIBRARIAN 2025 TIER 2-LIS

Topic Covered
Part 2 - All Units

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Unit 1 – Universe of Knowledge

KNOWLEDGE: NATURE, CHARACTERISTICS / PROPERTIES

1. Meaning and Nature of Knowledge

Knowledge refers to a **structured and organized collection of ideas, facts, theories, and experiences**, validated and accepted by experts or peer groups. It represents human understanding of reality, built through observation, study, and experience.

Knowledge is not static; it evolves with discoveries, innovation, and reinterpretation. It covers all aspects of human life — from science and technology to culture and ethics.

Aspect	Description
Definition	Systematic and organized understanding of facts, truths, and principles acquired through experience or education.
Validation	Verified by peer groups or experts.
Scope	Includes traditional and modern disciplines—natural sciences, social sciences, humanities, technology, and strategic studies.
Form	Can exist as tacit (personal experience) or explicit (recorded) knowledge.

Examples

1. Newton's laws of motion — structured scientific knowledge.
2. Historical records — knowledge of past human activities.
3. Medical research — applied and experimental knowledge.
4. Library cataloguing systems — organized informational knowledge.
5. Programming languages — technical and procedural knowledge.
6. Cultural traditions — experiential and social knowledge.

2. Expansion of Knowledge

Knowledge today has moved beyond isolated disciplines. It is **multidisciplinary, interrelated, and interconnected**, creating a web of understanding across fields.

Concept	Description
Multidisciplinary	Combines insights from multiple disciplines.
Interdisciplinary	Merges and integrates concepts between fields.
Transdisciplinary	Moves beyond boundaries to form new frameworks.
Dynamic Nature	Grows through research, sharing, and application.

Examples

1. Environmental Studies — integrates biology, chemistry, geography, and sociology.
2. Artificial Intelligence — merges computer science, linguistics, and psychology.
3. Bioinformatics — blends biology with information technology.
4. Political economy — links politics and economics.
5. Cultural anthropology — connects culture, linguistics, and history.
6. Data Science — uses mathematics, statistics, and computer systems.

3. Importance and Utilization of Knowledge

Knowledge gains meaning when it is **applied**. Stored knowledge without use has little impact. Utilization determines its social, scientific, or strategic value.

Type of Use	Description	Impact
Constructive	Used for innovation, welfare, and development.	Positive progress
Destructive	Used for harmful or unethical purposes.	Negative or dangerous
Strategic	Used for policy, defense, and governance.	National/global influence

Examples

1. Nuclear energy — constructive in power generation, destructive in warfare.
2. Internet technology — tool for education and communication.
3. Public health knowledge — improves community well-being.
4. Agricultural research — increases food production.
5. Financial literacy — helps personal and national growth.
6. Cybersecurity knowledge — protects data and systems.

4. Major Characteristics / Properties of Knowledge

Property	Explanation	Example
1. Infinite	Knowledge has no end; it continuously grows with discoveries.	Space exploration continues to reveal new facts.
2. Dynamic and expanding	Always changing and adapting to new findings.	Medical science evolves with new diseases.
3. Provisional and Corrective	No final truth; subject to criticism and modification.	Theories like atom models are revised over time.
4. Transferable Without Loss	Sharing knowledge does not diminish it.	A teacher retains knowledge after teaching students.
5. Mortal in Personal Form	Individual knowledge is lost unless recorded.	Ancient oral traditions vanished without documentation.
6. Obsolescence	Becomes outdated as new ideas emerge.	Old computer languages replaced by modern ones.

5. KNOWLEDGE: TYPES AND SCOPE

Knowledge can be classified into different **types** depending on its nature, source, and communication.

Three major divisions are:

- **Personal and Public Knowledge**
- **Tacit and Explicit Knowledge**
- **Three Worlds of Knowledge (Karl Popper)**

5.1 Personal and Public Knowledge

Type	Description	Accessibility	Source
Personal Knowledge (Private)	Knowledge belonging to an individual; based on experience, observation, and reflection.	Limited — unless shared.	Internal (personal learning, experience).

Public (Social) Knowledge	Knowledge held collectively by society, shared openly through institutions.	Freely available.	External (books, libraries, internet, research).

Key Points

- Both are interdependent. Personal knowledge builds public knowledge, and vice versa.
- Public knowledge is organized and preserved through libraries, archives, and information centers.
- Communication transforms private insight into shared understanding.

Examples

1. A scientist's personal hypothesis (personal).
2. A published research paper (public).
3. A craftsman's secret technique (personal).
4. A YouTube tutorial explaining that craft (public).
5. A student's learning experience (personal).
6. A government report on education (public).

5.2 Tacit and Explicit Knowledge (Michael Polanyi's Classification)

Type	Description	Communication	Example Form
Tacit Knowledge	Personal, intuitive, and experience-based knowledge. Hard to express.	Shared through observation or demonstration.	Skills, habits, insights.
Explicit Knowledge	Clearly expressed in words, numbers, or symbols.	Shared through writing, speech, or media.	Books, reports, documents.

Key Points

- Tacit knowledge is "in the mind or body" — we know more than we can explain.
- Explicit knowledge is "in records" — documented and stored.
- Tacit knowledge drives creativity; explicit knowledge ensures continuity.
- Modern organizations try to convert tacit knowledge into explicit form through documentation.

Examples

1. A dancer's instinctive movements (tacit).
2. A dance training manual (explicit).
3. A doctor's clinical intuition (tacit).
4. A written diagnosis report (explicit).
5. A painter's unique brush technique (tacit).
6. A museum catalogue of art (explicit).

5.3 Three Worlds of Knowledge (Karl Popper's View)

Karl Popper described three **ontological "worlds"** to represent all kinds of knowledge.Each world interacts with the others, forming a complete picture of human understanding.

World	Description	Nature of Knowledge	Examples
World 1	The physical world — material reality and natural phenomena.	Objective, external, observable.	Earth, plants, machines.

World 2	The mental world — thoughts, feelings, and perceptions of individuals.	Subjective, internal, experiential.	Ideas, emotions, memories.
World 3	The world of recorded knowledge — cultural, scientific, and artistic creations.	Objective, communicable, stored.	Books, art, laws, software.

Key Points

- **World 1** provides raw material for experience.
- **World 2** interprets and understands this material.
- **World 3** preserves and communicates that understanding.
- Libraries manage and organize **World 3 knowledge** (documents, data, media).
- The three worlds are interdependent — humans live in World 1, think in World 2, and record in World 3.

Examples

1. A tree or a river (World 1).
2. A poet's imagination about the river (World 2).
3. The poem written about it (World 3).
4. A software program (World 3).
5. The programmer's logic and reasoning (World 2).
6. The physical computer that runs it (World 1).

5.4 Organisation of Public Knowledge (Ziman's View)

Ziman emphasized three aspects of how **public knowledge** is organized:

Type of Organisation	Description	Example
1. Organisation by Creation	Knowledge generated through research, experimentation, and recording.	Scientific journals, research data.
2. Self-Organisation	Knowledge linked through references, citations, and conceptual connections.	Citation networks, bibliographic coupling.
3. Bibliographic Organisation	Knowledge arranged in bibliographies, catalogues, indexes, and databases.	Library catalogues, abstracting journals.

Examples

1. Scientists publishing research findings (creation).
2. Papers citing each other in Google Scholar (self-organisation).
3. A library's OPAC system (bibliographic).
4. Indexing services like *Scopus* or *Web of Science* (bibliographic).
5. A university thesis referencing previous studies (self-organisation).
6. Data repositories storing open-access articles (creation + organisation).

5.5 Scope of Knowledge

The **scope of knowledge** is limitless — it expands across physical, mental, and cultural dimensions.
It covers **all disciplines** — natural sciences, social sciences, humanities, technology, philosophy, and emerging fields.

Scope Area	Description	Example
Natural Sciences	Understanding of natural phenomena.	Physics, Chemistry, Biology.
Social Sciences	Study of human society and relationships.	Sociology, Political Science.
Humanities	Study of culture, language, and history.	Literature, Philosophy, History.
Applied Sciences	Practical use of scientific principles.	Engineering, Medicine.
Information and Technology	Creation, storage, and dissemination of information.	AI, Data Science, ICT.
Strategic and Cultural Knowledge	National planning, cultural identity, global communication.	Foreign policy, media studies.

Examples

1. Research in renewable energy (Natural Science).
2. Study of voting behavior (Social Science).
3. Preservation of ancient manuscripts (Humanities).
4. Development of robotics (Applied Science).
5. Creation of online databases (Information Science).
6. National defense analysis (Strategic Knowledge).

6. FORMATION OF KNOWLEDGE

The **formation of knowledge** refers to how different subjects and ideas are created, developed, and organized in a structured manner.

As knowledge expands rapidly, libraries and information centers must adapt classification systems and retrieval tools (like catalogues, indexes, and thesauri) to match this growth.

Dr. **S. R. Ranganathan** (the father of Library Science in India) studied how **subjects form and evolve**.

He proposed **five preliminary modes of formation of knowledge**, which explain how new subjects, branches, or specializations emerge from existing bodies of knowledge.

6.1 Ranganathan's Modes of Formation of Knowledge

Mode	Meaning / Definition	Nature of Process
1. Dissection	Dividing a broad subject into several smaller but related parts.	Analytical
2. Lamination	Combining facets (layers) to form a compound subject.	Synthetic
3. Denudation	Narrowing the focus of a subject to a deeper, more specific level.	Specialization
4. Loose Assemblage	Grouping two or more related subjects without full integration.	Associative
5. Superimposition	Connecting two or more ideas within the same field due to shared characteristics.	Integrative

6.1.1 Dissection

Definition:

Dissection is the process of **dividing a broad subject into coordinate subparts**, each having equal status — like slicing a loaf of bread into pieces.

Aspect	Description
Purpose	To create subfields for better understanding and study.
Outcome	Independent branches within a larger field.
Analogy	Cutting a universe of entities into laminae (thin layers).

Examples

1. The biological sciences divided into **Botany**, **Zoology**, and **Microbiology**.
2. Social sciences divided into **Economics**, **Political Science**, and **Sociology**.
3. Engineering divided into **Civil**, **Mechanical**, and **Electrical**.
4. Literature divided into **Poetry**, **Drama**, and **Prose**.
5. Library Science divided into **Cataloguing**, **Classification**, and **Information Retrieval**.
6. Medical Science divided into **Anatomy**, **Physiology**, and **Pathology**.

6.1.2 Lamination

Definition:

Lamination is the **construction of a compound subject by overlaying one idea (facet) on another**, similar to layering in a sandwich.

Aspect	Description
Purpose	To combine related concepts from different subjects.
Outcome	Formation of compound or multi-faceted subjects.
Analogy	Layering of knowledge facets to form new combinations.

Examples

1. **Agriculture of Corns** (Agriculture + Corns).
2. **Chemistry of Metals** (Chemistry + Metals).
3. **History of India** (History + India).
4. **Physics of Sound** (Physics + Sound).
5. **Education of Women** (Education + Women).
6. **Computer Applications in Library Science** (Computer Science + Library Science).

6.1.3 Denudation

Definition:

Denudation is the **progressive narrowing or deepening** of a subject — moving from general to more specific, or from surface-level to deeper understanding.

Aspect	Description
Purpose	To explore deeper or more specialized areas within a subject.
Outcome	Emergence of highly focused branches of study.
Analogy	Excavating deeper layers, like digging a well or peeling fruit.

Examples

1. **Philosophy → Logic → Symbolic Logic**.
2. **Physics → Quantum Physics → String Theory**.
3. **Linguistics → Semantics → Computational Semantics**.

4. **Chemistry → Organic Chemistry → Polymer Chemistry**.
5. **History → Medieval History → Mughal History**.
6. **Library Science → Knowledge Organization → Faceted Classification**.

6.1.4 Loose Assemblage

Definition:

Loose assemblage is the **association of two or more related subjects** that remain separate but are studied together for understanding their relations.

Aspect	Description
Purpose	To study interactions between distinct but related fields.
Outcome	Formation of interdisciplinary or comparative subjects.
Analogy	Bringing together independent entities for correlation.

Examples

1. **Political Science and Economics** (Political Economy).
2. **Sociology and Anthropology** (Socio-Anthropology).
3. **Biology and Chemistry** (Biochemistry).
4. **Psychology and Education** (Educational Psychology).
5. **Art and History** (Art History).
6. **Geography and Environmental Science** (Environmental Geography).

6.1.5 Superimposition

Definition:

Superimposition is the **connection or overlap of two or more ideas** within the same universe of knowledge, when an entity shares properties of multiple categories.

Aspect	Description
Purpose	To represent hybrid or overlapping concepts.
Outcome	Formation of new interdisciplinary identities.
Analogy	Placing one idea over another to show combined characteristics.

Examples

1. **Bioinformatics** (Biology + Information Technology).
2. **Astrobiology** (Astronomy + Biology).
3. **Geophysics** (Geology + Physics).
4. **Psycholinguistics** (Psychology + Linguistics).
5. **Neuroeducation** (Neuroscience + Education).
6. **Agroecology** (Agriculture + Ecology).

6.2 Importance of Understanding Modes of Formation

Reason	Explanation
1. Helps in Classification	Assists librarians in assigning correct subjects and call numbers.
2. Tracks Subject Growth	Shows how disciplines evolve and interrelate.
3. Aids in Knowledge Organization	Useful in developing taxonomies and ontologies.
4. Improves Information Retrieval	Enhances accuracy in search and indexing.
5. Theoretical Foundation	Supports systems like Colon Classification.

6. Future-Proofing	Prepares for new interdisciplinary subjects.

7. NEELAMEGHAN'S EXTENSION OF RANGANATHAN'S MODES OF FORMATION OF KNOWLEDGE

Dr. **A. Neelameghan**, building upon **Ranganathan's theory**, further refined the understanding of how subjects evolve.

He introduced several **micro-modes of formation** that reflect more nuanced and modern ways in which **new knowledge areas** are created and organized.

These micro-modes explain **how disciplines divide, merge, specialize, or cluster** in response to new research trends and societal needs.

7.1 Fission

Aspect	Description
Definition	The **internal division or splitting** of a subject into smaller parts **without external influence**.
Difference from Dissection	Dissection is external division; Fission is internal, natural separation.
Nature	Spontaneous growth and differentiation within a subject.

Examples

1. **Physics** splitting into **Classical Physics** and **Quantum Physics**.
2. **Linguistics** dividing into **Syntax**, **Semantics**, and **Phonology**.
3. **Computer Science** splitting into **AI**, **Cybersecurity**, and **Data Science**.
4. **Economics** separating into **Microeconomics** and **Macroeconomics**.
5. **Geology** forming **Petrology**, **Mineralogy**, and **Paleontology**.
6. **Library Science** dividing into **Knowledge Organization** and **Information Retrieval**.

7.2 Distillation of Kind 1

Aspect	Description
Definition	Formation of a **new subject** based on **common observations, experiments, or methods** drawn from multiple fields.
Nature	Synthesizes shared methodologies or principles into a distinct discipline.
Focus	Generalized techniques or systems emerging from many applied fields.

Examples

1. **Management Science** — distilled from management of labs, industries, and universities.
2. **Systemology** — principles derived from system analysis in multiple fields.
3. **Metrology** — measurement science developed across disciplines.
4. **Research Methodology** — distilled from practices in varied research areas.
5. **Information Science** — derived from librarianship, computer science, and communication.
6. **Conference Techniques** — drawn from experiences in academic and corporate event management.

7.3 Distillation of Kind 2

Aspect	Description
Definition	Formation of a **new specialized subject** through **intensive and focused study** of a specific idea or sub-area.
Nature	Emerges from deep, specialized research or academic development.
Result	A formerly dependent topic gains independent subject status.

Examples

1. **Microbiology** emerging from **Biology** and **Botany**.
2. **Statistical Calculus** evolving from **Mathematics**.
3. **International Relations** branching from **Political Science**.
4. **Demography** developing from **Sociology**.
5. **Molecular Biology** from **Genetics** and **Biochemistry**.
6. **Linguistic Anthropology** from **Anthropology** and **Linguistics**.

7.4 Fusion

Aspect	Description
Definition	The **merging of two or more disciplines** to form a new, integrated field through interdisciplinary research.
Nature	Creative combination producing new concepts, theories, and tools.
Result	A field with its own principles, vocabulary, and methods.

Examples

1. **Astrophysics** (Astronomy + Physics).
2. **Biomechanics** (Biology + Mechanics).
3. **Psycholinguistics** (Psychology + Linguistics).
4. **Socio-Cybernetics** (Sociology + Cybernetics).
5. **Bioinformatics** (Biology + Computer Science).
6. **Geochemistry** (Geology + Chemistry).

7.5 Cluster Formation

Aspect	Description
Definition	Formation of a **core study area** that draws insights and contributions from several related disciplines.
Nature	Multi-disciplinary and thematic; focused around a central theme or personality.
Purpose	Integrates diverse viewpoints around a single research nucleus.

Examples

1. **Sinology** (Chinese Studies) — integrating history, language, and culture.
2. **Tibetology** — studies around Tibetan culture and religion.
3. **Gandhiana** — interdisciplinary studies of Mahatma Gandhi's philosophy.
4. **Environmental Sciences** — integrating ecology, chemistry, and policy.
5. **Ocean Sciences** — combining marine biology, geology, and climatology.
6. **Defense Studies** — involving politics, technology, and strategy.

7.6 Agglomeration of Kind 1

Aspect	Description
Definition	Subjects treated **together but distinctly** in a single document or study.
Nature	Integral yet parallel treatment of different disciplines.
Purpose	To explore relationships between major knowledge domains.

Examples

1. **Natural Sciences and Humanities** discussed in one compendium.
2. **Science and Religion** in a comparative analysis.
3. **Art and Technology** in innovation studies.
4. **Economics and Philosophy** in moral economy research.
5. **Law and Ethics** in professional education.
6. **Politics and History** in governance studies.

7.7 Agglomeration of Kind 2

Aspect	Description
Definition	A subject **comprehending or encompassing** other subjects **within a classification schedule**.
Nature	Hierarchical inclusion; one subject dominates others in structure.
Example from Classification	Found in systems like UDC (Universal Decimal Classification).

Examples

1. **Psychology and Sociology** grouped together in UDC.
2. **Education including Psychology** under the same class in classification.
3. **Environmental Science** encompassing **Ecology** and **Climatology**.
4. **Cultural Studies** including **Anthropology** and **Media Studies**.
5. **Library and Information Science** including **Bibliometrics** and **Knowledge Management**.
6. **Health Sciences** covering **Medicine**, **Nursing**, and **Pharmacology**.

7.8 Importance of Neelameghan's Contribution

Significance	Description
1. Deepens Ranganathan's Theory	Offers finer understanding of how subjects evolve.
2. Reflects Modern Interdisciplinarity	Accounts for cross-disciplinary and applied fields.
3. Aids in Classification Development	Useful for refining subject schedules and codes.
4. Supports Knowledge Organization Systems	Helps in ontology, taxonomy, and metadata design.
5. Enhances Information Retrieval	Provides logical structure for digital libraries.
6. Encourages Continuous Research	Recognizes that subject formation is ongoing and dynamic.

8. ORIGIN AND GROWTH PATTERN OF DISCIPLINES

The **origin and growth of disciplines** reflect how human knowledge gradually organizes itself into structured, recognized fields of study.

While Ranganathan and Neelameghan focused on the *formation of subjects*, other scholars have examined the *social and intellectual evolution* of disciplines — how they emerge, specialize, and sustain scholarly communities.

8.1 Meaning of a Discipline

Aspect	Description
Etymology	Derived from *disciple*, meaning "one who learns."
Definition	A **discipline** is a structured and organized field of intellectual inquiry pursued by a community of scholars.
Nature	It is both social (community-based) and intellectual (knowledge-based).
Purpose	To generate, validate, and transmit specialized knowledge through systematic methods.

Examples

1. **Physics** — study of matter and energy.
2. **Sociology** — systematic study of society.
3. **Philosophy** — inquiry into reality, existence, and knowledge.
4. **Economics** — analysis of production and distribution.
5. **Computer Science** — study of algorithms and computation.
6. **Library and Information Science (LIS)** — organization, retrieval, and dissemination of knowledge.

8.2 Attributes of Scholarly Disciplines

Attribute	Description	Example
1. Distinction between Knowledge and Opinion	Scholarly knowledge is verified and objective; opinion is subjective.	Scientific theories vs. personal beliefs.
2. Scholarly Community	Disciplines consist of groups of experts sharing a common inquiry.	Physicists' community or historians' society.
3. Range and Depth	Disciplines include basic to advanced levels of study.	Introductory biology → molecular biology research.
4. Authenticity and Rigor	Critical evaluation ensures credibility.	Peer-reviewed journals and academic conferences.
5. Distinct Domain and Method	Each discipline has its own focus and methodology.	Historical analysis differs from laboratory experiments.
6. Classification and Structure	Subjects within a discipline are organized systematically.	Dewey Decimal or Colon Classification for LIS.
7. Communication Structure	Disciplines share knowledge via publications, journals, and conferences.	Nature, Cell, or JASIST.
8. Specialized Vocabulary	Each discipline develops its own terminology.	"Entropy" in physics, "Syntax" in linguistics.

Examples

1. **Chemistry** — precise terminology and lab validation.
2. **Psychology** — standardized testing and research ethics.
3. **Law** — case-based reasoning and legal vocabulary.

4. **Medicine** — peer-reviewed research and clinical trials.
5. **Linguistics** — phonetic notation and syntax rules.
6. **Library Science** — indexing, metadata, cataloguing principles.

8.3 How Disciplines Develop

Stage	Description	Example
1. Conceptual Stage	New ideas or observations form a basic inquiry.	Early philosophical thought in ancient Greece.
2. Experimental Stage	Testing and verification of ideas through methods.	Galileo's experiments in physics.
3. Institutional Stage	Establishment of formal study centers, societies, or journals.	Royal Society (1660) in England.
4. Academic Stage	Inclusion in university curricula.	Economics or Sociology becoming formal subjects.
5. Specialization Stage	Creation of sub-disciplines and applied fields.	Biochemistry from biology + chemistry.
6. Integration Stage	Interdisciplinary collaboration and fusion.	Environmental Studies integrating sciences and policy.

Examples

1. **Mathematics** → led to **Statistics** and **Data Science**.
2. **Biology** → developed into **Genetics** and **Microbiology**.
3. **Linguistics** → led to **Psycholinguistics** and **Computational Linguistics**.
4. **Philosophy** → evolved into **Logic** and **Ethics**.
5. **Engineering** → expanded into **Software Engineering**.
6. **Library Science** → evolved into **Information Science**.

8.4 Variation Across Disciplines

Disciplines differ in **methods**, **purposes**, and **domains** of inquiry:

Category	Characteristics	Example
Natural Sciences	Empirical, experimental, and law-based.	Physics, Chemistry, Biology.
Social Sciences	Observational, interpretative, theory-driven.	Sociology, Anthropology, Economics.
Humanities	Reflective, historical, and aesthetic.	Literature, Philosophy, Fine Arts.
Applied Sciences	Practical, problem-solving focus.	Medicine, Engineering, Library Science.
Interdisciplinary Fields	Integrate theories and methods from multiple areas.	Cognitive Science, Data Science.

Examples

1. **Physics** (laws and experiments).
2. **Sociology** (social behavior).
3. **Philosophy** (conceptual reasoning).
4. **Engineering** (applied problem-solving).
5. **Art** (creative expression).
6. **Information Science** (fusion of technology and communication).

8.5 Relevance to Library and Information Studies

Aspect	Explanation
1. Interdisciplinary Nature	Library and Information Science connects all disciplines through documentation and retrieval.
2. Knowledge Organization	Understanding how disciplines evolve helps design better classification systems.
3. Literature Search	Professionals must know the disciplinary boundaries to conduct accurate searches.
4. Information Retrieval	Subject indexing depends on awareness of disciplinary structure.
5. Collection Development	Libraries curate materials representing all major disciplines.
6. Knowledge Mapping	Understanding interrelations among disciplines supports knowledge visualization and taxonomy design.

Examples

1. Designing subject headings for interdisciplinary topics.
2. Building databases covering multiple academic fields.
3. Creating bibliographies for new disciplines (e.g., Data Ethics).
4. Cross-referencing between related fields in catalogues.
5. Managing institutional repositories for academic outputs.
6. Supporting interdisciplinary research in digital libraries.

9. MAPPING OF THE STRUCTURE OF SUBJECTS

After understanding how subjects are **formed (Ranganathan & Neelameghan)** and how **disciplines grow**, the next logical step is to study how subjects can be **mapped and visualized** — to reveal how ideas interconnect, evolve, and influence each other.

Mapping of subjects helps **library and information professionals** trace the relationships among concepts, identify interdisciplinary links, and improve **information retrieval systems**.

9.1 Citation Analysis and Subject Structuring

Aspect	Description
Originator	**Eugene Garfield**, founder of the *Science Citation Index* and Citation Studies.
Concept	Citation analysis uses references (citations) in scholarly works to identify **relationships between documents, authors, and concepts**.
Idea	When one paper cites another, a **conceptual link** is formed — showing influence or connection of ideas.
Purpose	To structure knowledge by analyzing **patterns of citations** to discover **concept clusters** and **subject relationships**.
Outcome	Mapping of intellectual structure across disciplines — showing core and peripheral areas of research.

Key Points

- Citation analysis reveals how **knowledge flows** from one research work to another.
- The **citation network** shows **interdisciplinary connections** and emerging subjects.
- It also helps in identifying **core journals**, **authors**, and **research fronts**.
- In libraries, citation studies aid in **collection development** and **database indexing**.

- Concept clusters can be represented using **citation matrices** and **co-citation maps**.

Examples

1. **Garfield's Science Citation Index (SCI)** — linking research papers through citations.
2. **Co-citation analysis** showing the overlap between **information science** and **computer science**.
3. **Bibliographic coupling** — two papers sharing the same references.
4. **Citation networks** identifying influential authors in **artificial intelligence research**.
5. **Citation clustering** revealing new interdisciplinary areas like **bioinformatics**.
6. **Journal Citation Reports (JCR)** — ranking journals based on citation impact.

9.2 Concept Clusters and Interdisciplinarity

Aspect	Description
Concept Clusters	Groups of related ideas or topics identified through repeated citation connections.
Significance	They represent the **intellectual core** of a discipline or the **crossroads** of multiple disciplines.
Use in Libraries	Helps identify emerging fields and gaps in existing collections.

Examples

1. Cluster linking **Information Retrieval**, **Machine Learning**, and **Digital Libraries**.
2. Cluster showing connection between **Climate Science**, **Policy**, and **Economics**.
3. Cluster bridging **Cognitive Science** and **Artificial Intelligence**.
4. Cluster uniting **Public Health** and **Data Analytics**.
5. Cluster linking **Sociology**, **Gender Studies**, and **Media Studies**.
6. Cluster connecting **Education**, **Technology**, and **Psychology**.

9.3 Graphic Display of Knowledge Structures

Aspect	Description
Definition	The **visual representation** of concept relationships using diagrams, networks, or maps.
Purpose	To show how subjects are interrelated beyond the limitations of linear classification.
Comparison	Traditional classification systems (like DDC or CC) are **linear**; graphic displays are **multidimensional**.
Benefit	Makes **complex conceptual structures** easier to understand, index, and retrieve.

Common Graphic Techniques

Technique	Description	Example Use
Concept Maps	Show hierarchical and associative links between concepts.	Library subject thesauri.
Knowledge Graphs	Visualize data and concept interconnections digitally.	Semantic web and ontologies.
Citation Networks	Map how authors and papers cite each other.	Scopus or Google Scholar maps.
Co-word Analysis Maps	Show keyword co-occurrences in research papers.	Text mining in LIS databases.
Thematic Atlases	Represent broad and narrow subjects visually.	Academic field visualizations.

Examples

1. **Mind map of Library Science** linking cataloguing, indexing, and metadata.
2. **Knowledge graph of Artificial Intelligence** showing related subfields.
3. **Citation map of Medical Research** connecting genetics and biochemistry.
4. **Concept map of Environmental Studies** linking ecology, policy, and climate.
5. **Network map in Scopus** showing author collaboration patterns.
6. **Atlas of Humanities and Sciences** displaying cross-disciplinary connections.

9.4 Advantages of Graphic and Citation Mapping

Advantage	Description
1. Multidimensional Representation	Captures complex subject relationships beyond linear hierarchies.
2. Identification of Core Areas	Helps recognize central research themes or "hot spots."
3. Detection of Emerging Fields	Reveals interdisciplinary trends and new research directions.
4. Information Retrieval Efficiency	Enhances searching and browsing in digital databases.
5. Visual Insight for Researchers	Provides an overview of subject interconnections.
6. Support for Library Planning	Assists librarians in resource allocation and collection management.

Examples

1. Visualizing **interdisciplinary journals** through citation analysis.
2. Mapping **COVID-19 research** across medicine, data science, and economics.
3. Creating **concept graphs** in university repositories.
4. Using **co-citation maps** for LIS subject indexing.
5. Displaying **scientific collaboration networks** in research analytics.
6. Designing **visual thesauri** for knowledge organization.

9.5 Analogy: The Atlas Model

Garfield's mapping approach can be visualized like a **"Knowledge Atlas"**, where subjects are mapped as continents, countries, and cities — each representing broader, narrower, and related concepts respectively.

Analogy Level	Meaning	Example
World Atlas	Entire domain of human knowledge.	The universe of knowledge.
Continents	Broad subject fields.	Science, Humanities, Social Sciences.
Countries	Disciplines.	Biology, History, Economics.
Cities	Sub-disciplines.	Microbiology, Political Economy.
Streets	Specific topics or concepts.	Genetic Mutation, Fiscal Policy.

Examples

1. **Geographical Atlas analogy** for subject mapping.
2. **Science Atlas** — displaying connections between physics, chemistry, and biology.
3. **Information Atlas** — mapping data flow in knowledge systems.
4. **Digital Humanities Atlas** — showing convergence of tech and culture.
5. **Atlas of Innovation** — charting interdisciplinary inventions.

6. **Library Subject Atlas** — depicting links between cataloguing, metadata, and user behavior.

9.6 Relevance to Library and Information Studies

Area	Relevance
Knowledge Organization	Helps librarians visualize relationships among concepts for better classification and indexing.
Information Retrieval	Improves keyword searching and topic clustering in databases.
Bibliometrics and Scientometrics	Supports evaluation of scholarly impact through citation mapping.
Collection Development	Identifies growing or neglected research areas.
Digital Libraries	Enables visual browsing of subjects and themes.
User Education	Helps users understand how topics connect across disciplines.

Examples

1. Creating **citation-based subject maps** in LIS research.
2. Using **co-citation analysis** for subject indexing in OPAC.
3. Developing **visual browsing interfaces** in digital libraries.
4. Mapping **interdisciplinary resources** in repository systems.
5. Tracking **research impact** through citation clusters.
6. Designing **ontology-based catalogues** for better retrieval.

10. KNOWLEDGE UTILISATION

Knowledge utilisation means the **application of knowledge for social, economic, scientific, and technological advancement.**

A society's progress depends not only on generating knowledge but also on how effectively it is **disseminated, shared, and applied** for innovation and development.

As societies evolve from agricultural to industrial and then to information-based systems, they increasingly rely on **knowledge as the key resource** for growth and decision-making.

10.1 Concept and Meaning

Aspect	Description
Definition	The process of applying acquired or existing knowledge to solve real-world problems, make policies, innovate, and develop society.
Objective	To transform theoretical knowledge into practical, usable outcomes.
Relevance	Essential for innovation, policy-making, national planning, and technological progress.
Outcome	Emergence of a **knowledge-based society** or **information society**.

Examples

1. Use of **scientific knowledge** for agricultural improvement.
2. Application of **economic theories** in national budgeting.
3. **Medical research** applied to public health policies.
4. Use of **climate studies** for environmental planning.
5. **AI and data analytics** for smart governance.
6. **Library digitization** to improve public access to knowledge.

10.2 Transition to a Knowledge Society

Stage	Description	Knowledge Role
Pre-Industrial (Agrarian)	Based on agriculture and manual labor.	Limited, practical knowledge.
Industrial	Driven by machines, energy, and production systems.	Technical and applied knowledge.
Post-Industrial / Knowledge Society	Dominated by information, research, and innovation.	Knowledge becomes the primary economic resource.

Examples

1. Agricultural societies using traditional methods (Pre-industrial).
2. Industrial revolution in 18th–19th centuries (Industrial).
3. Digital economy of 21st century (Knowledge society).
4. Japan's shift to robotics and R&D culture.
5. Silicon Valley as a global innovation hub.
6. India's IT and software revolution representing knowledge utilization.

10.3 Impact of Information and Communication Technology (ICT)

Aspect	Description
Role of ICT	Acts as a catalyst in creating, storing, distributing, and using knowledge efficiently.
Tools	Internet, World Wide Web, Databases, E-mail, Multimedia, Cloud Storage.
Impact	Enables global access to information, collaboration, and innovation in real time.
Challenge	Creates a **digital divide** between information-rich and information-poor societies.

Key Points

- ICT transforms recorded knowledge into **interactive, accessible global resources**.
- Encourages **knowledge sharing** through online learning and research collaboration.
- Enhances **productivity** in education, government, and industries.
- Facilitates **knowledge management systems** in organizations.

Examples

1. **Online education** through MOOCs and virtual universities.
2. **E-journals and databases** providing instant global access.
3. **Video conferencing** for international academic collaboration.
4. **Open Access repositories** sharing research publicly.
5. **Social media platforms** as knowledge exchange tools.
6. **Digital libraries** bridging geographical barriers.

10.4 Digital Divide

Aspect	Description
Definition	The gap between individuals, regions, or countries in terms of access to information and communication technologies.
Cause	Unequal infrastructure, education, income, and digital literacy.
Impact	Limits participation in the knowledge economy for developing regions.

Solution	ICT infrastructure development, digital literacy programs, open access policies.

Examples

1. Developed nations (USA, Japan) having greater ICT access than developing ones.
2. Urban areas with high-speed Internet vs. rural areas without connectivity.
3. Universities with digital libraries vs. small institutions lacking resources.
4. Countries with advanced R&D funding vs. low-resource economies.
5. Unequal access to e-learning platforms during the COVID-19 pandemic.
6. Global efforts like **UNESCO's Knowledge Societies Programme** addressing the divide.

10.5 The Indian Context

India has actively pursued the **utilization of knowledge** through institutional and policy initiatives, especially since independence.

Aspect	Description
Policy Foundation	*Scientific Policy Resolution (1958)* by **Pandit Jawaharlal Nehru** emphasized the role of science and technology in national development.
Institutional Development	Establishment of **R&D centers**, **universities**, **IITs**, **IIMs**, **CSIR labs**, and **research institutes**.
Objective	To create an environment for knowledge creation, transfer, and application.
Current Focus	Software technology, ICT innovation, and knowledge-based services.

Examples

1. **Council of Scientific and Industrial Research (CSIR)** — national R&D network.
2. **Indian Institutes of Technology (IITs)** — centers of scientific and engineering excellence.
3. **Indian Institutes of Management (IIMs)** — focus on management and policy knowledge.
4. **National Informatics Centre (NIC)** — promoting e-governance.
5. **Digital India Mission** — enabling digital access and infrastructure.
6. **Software technology parks (STPIs)** — fostering India's IT power globally.

10.6 Knowledge as a Resource for Development

Dimension	Description	Example
Economic	Knowledge-based industries drive growth and employment.	IT, biotech, financial analytics.
Scientific	Research leads to innovation and patents.	ISRO, DRDO projects.
Social	Informed citizens improve governance and equality.	Open data and public awareness initiatives.
Cultural	Digital preservation of heritage knowledge.	National Digital Library of India.
Educational	Online learning and academic networks.	SWAYAM, NPTEL, Coursera.
Political	Data-driven policymaking and e-governance.	RTI, policy dashboards.

Examples

1. **Knowledge economy** driving GDP growth.
2. **Research parks and innovation hubs** promoting startups.
3. **Digital archives** conserving cultural heritage.
4. **Data-driven governance** through analytics.

5. **E-learning platforms** spreading education equitably.
6. **Collaborative research networks** connecting Indian and global scholars.

11. MAPPING OF THE UNIVERSE OF KNOWLEDGE

Knowledge is not static — it grows, shifts, and reorganizes continuously.

As new ideas emerge, old ones fade or change form. Mapping the universe of knowledge means understanding how **different subjects relate, evolve, and interact** within a given period or cultural context.

There is **no fixed or universal map** of knowledge that fits all societies or times. The structure of knowledge is shaped by the **values, needs, and philosophies** of each age.

11.1 Nature of the Universe of Knowledge

Aspect	Description
Dynamic	Knowledge constantly grows, changes, and expands with new discoveries.
Relational	Subjects influence one another; boundaries are fluid and often overlapping.
Contextual	The structure of knowledge reflects the social, cultural, and philosophical environment of a society.
Non-Universal	No single classification can represent all human knowledge across all times.
Mapped Through Classification	Classification schemes serve as **maps** of knowledge at specific points in history.

Examples

1. **Medieval Era** — Theology dominated as the "queen of sciences."
2. **19th Century** — Philosophy and theology still central (e.g., in Dewey Decimal Classification).
3. **20th Century** — Rise of physical and social sciences.
4. **21st Century** — Information technology and biotechnology dominate.
5. **Environmental studies** emerging as a global concern.
6. **Artificial intelligence** reshaping all disciplines through interdisciplinary research.

11.2 Influence of Society and Culture on Knowledge Structure

Influencing Factor	Description	Effect on Knowledge
Philosophy and Religion	Prevailing belief systems shape which subjects are valued.	Theology was central in medieval Europe.
Economic and Technological Needs	Industrial or digital revolutions shift focus to applied sciences.	Engineering and IT gain prominence.
Cultural Values	Each society defines what counts as "useful" knowledge.	Humanities and ethics valued in humanistic societies.
Political and Social Goals	Nations prioritize disciplines linked to national development.	Defense studies, management, economics.
Historical Context	Each age reorganizes knowledge according to its worldview.	From religious to scientific paradigms.

Examples

1. The **Industrial Revolution** emphasizing mechanical engineering.
2. The **Digital Revolution** prioritizing information and computer sciences.
3. **Cold War-era** focus on nuclear research and space studies.

4. **Modern environmental movement** creating ecology and sustainability studies.
5. **Globalization** expanding business, communication, and policy studies.
6. **Post-COVID era** boosting health sciences and digital transformation.

11.3 Evolution of Subject Importance Over Time

Period	Dominant Subject(s)	Reason for Dominance
Middle Ages	Theology and Philosophy	Religious worldview.
18th–19th Century	Natural Sciences, Mathematics	Industrial and scientific revolutions.
Early 20th Century	Engineering, Economics, Social Sciences	Industrial expansion and reform movements.
Late 20th Century	Management, Computer Science	Technological advancement.
21st Century	Environment, ICT, Biotechnology	Knowledge society and sustainability focus.

Examples

1. Shift from **theology** to **science** as main knowledge domain.
2. **Sociology** emerging after industrialization.
3. **Psychology** becoming a distinct discipline in modern academia.
4. **Information Science** growing with computing.
5. **Biotechnology** emerging through fusion of biology and technology.
6. **AI and data science** defining modern interdisciplinary studies.

11.4 Classifications Are Impermanent

Aspect	Description
Constant Change	As knowledge evolves, classifications must adapt.
Fluid Boundaries	Subjects shift from compound to basic or new forms.
Living Systems	Classification schemes grow with time — they're not static.
Example of Ranganathan's Colon Classification (CC)	Subjects like public health and demography upgraded from compound to basic subjects between CC 6th (1960) and 7th (1987) editions.
Implication	Knowledge organization must evolve with research trends and new disciplines.

Examples

1. **Public Health** → Became an independent discipline.
2. **International Law** → Gained separate identity.
3. **Geopolitics** → Evolved from political geography.
4. **Demography** → Developed into a core social science.
5. **Information Technology** → Not present in early classifications, now central.
6. **Library Science** → Expanded into **Library and Information Science (LIS).**

11.5 Classification as a Map of Knowledge

Concept	Description
Purpose	Classification represents the structure and interrelations of knowledge in an organized way.
Function	Serves as a **map** for analysis, retrieval, and understanding of the universe of knowledge.
Evolutionary Nature	Needs revision as knowledge expands and new disciplines emerge.
Examples of Classification Systems	Dewey Decimal Classification (DDC), Library of Congress Classification (LCC), Universal Decimal Classification (UDC), Colon Classification (CC).

Examples

1. **DDC (1876)** — Focused heavily on theology and philosophy.
2. **LCC** — Flexible, reflecting American academic trends.
3. **UDC** — Adapted DDC for universal application.
4. **CC (Ranganathan)** — Introduced facets and dynamic growth.
5. **BC2 (Bliss Bibliographic Classification)** — More conceptually modern.
6. **Web-based Ontologies** — Organize digital and interdisciplinary knowledge.

11.6 Need for New Classification Systems

Aspect	Description
Reason	The growth of digital information and the Internet has made older linear classification inadequate.
Future Focus	21st-century classification must support dynamic, networked, and interdisciplinary knowledge.
Approach	Integration of bibliographic, semantic, and digital mapping techniques.
Vision	A classification system that evolves with human knowledge and technology.

Examples

1. **Internet classification systems** using metadata and tags.
2. **Ontology-based classifications** for semantic web data.
3. **Digital library structures** (e.g., DSpace taxonomy).
4. **Wikipedia category mapping** as an informal classification model.
5. **AI-driven clustering** of research data.
6. **Linked Data** models connecting diverse knowledge repositories.

12. PRINCIPLES FOR MAPPING THE UNIVERSE OF KNOWLEDGE

The **mapping of the universe of knowledge** is guided by certain theoretical principles that determine how subjects are arranged, related, and valued.

According to **D. W. Langridge (1925–2001)**, an eminent English librarian and classification theorist, there are **four key principles** for mapping knowledge.

These principles are **not mutually exclusive**; they often overlap in practice and reflect how societies view and organize knowledge.

12.1 Ideological Principle

Aspect	Description

Definition	Mapping of knowledge based on the **ideology, philosophy, or worldview** of a society or period.
Nature	Reflects cultural, political, or religious beliefs rather than neutral logic.
Observation	Every classification carries some ideological bias, shaped by its origin and context.
Implication	No scheme is truly "value-free"; all mirror their time's assumptions and priorities.

Examples

1. **Medieval Christian classifications** centered around theology as the supreme science.
2. **Russian BBK system** built around **Marxism–Leninism**.
3. **Dewey Decimal Classification (DDC)** giving large space to **Christianity and Western thought**.
4. **Islamic classification systems** rooted in Quranic and theological divisions.
5. **Confucian educational models** in China shaping subject hierarchies.
6. **Modern global adaptations of DDC/UDC** to reflect African and Asian subjects and values.

12.2 Principle of Social Purpose

Aspect	Description
Definition	Arrangement of knowledge based on **its utility to society** — moral, material, or spiritual.
Origin	Rooted in the **Vedic system** (1500 BC) dividing knowledge into *Dharma*, *Artha*, *Kama*, and *Moksha*.
Nature	Reflects knowledge as serving human and societal needs in a hierarchy of importance.
Influence	Inspired later scholars like **S. R. Ranganathan**, though not directly applied in Colon Classification.
Purpose	To express knowledge in terms of its function and role in human life, not purely by subject.

Examples

1. **Dharma (Normative principles)** — Ethics, Law, Social Order.
2. **Artha (Practical/social sciences)** — Economics, Politics, Commerce.
3. **Kama (Arts and sciences)** — Literature, Music, Fine Arts.
4. **Moksha (Spiritual knowledge)** — Philosophy, Religion, Theology.
5. **Modern development studies** focusing on social utility.
6. **Public policy research** ranking knowledge by societal relevance.

12.3 Scientific Order

Aspect	Description
Definition	Arrangement of subjects according to the **natural or logical order of phenomena**, following evolutionary or integrative patterns.
Origin	Introduced by **E. C. Richardson (1901)** and developed by **C. A. Cutter**, **H. E. Bliss**, and later **J. E. L. Farradane** and **D. J. Foskett**.
Core Idea	"The order of sciences is the order of things, and the order of things is the order of their complexity."
Theoretical Basis	Related to **Darwin's theory of evolution** and later the **theory of integrative levels** — from simple to complex entities.
Application	Used in modern classification systems to represent a natural progression from basic to applied sciences.

Examples

1. **Cutter's Expansive Classification (1893)** — evolutionary order of main classes.

2. **Bliss's Bibliographic Classification (1935)** — integrative levels theory applied.
3. **Library of Congress Classification (LCC)** — broadly scientific progression.
4. **Colon Classification (CC)** — taxonomic order in natural sciences.
5. **DDC sections in Botany/Zoology** — following taxonomic hierarchy.
6. **Modern subject ontologies** — organizing data by complexity (atoms → molecules → organisms → societies).

12.4 Principle of Arrangement by Disciplines

Aspect	Description
Definition	Division of the universe of knowledge into **major disciplines or fields of study**, each representing a coherent body of knowledge.
Origin	Traced to **Francis Bacon's "Advancement of Learning" (1605)**, who divided knowledge by the three human faculties — *Memory, Imagination, Reason.*
Bacon's Division	- *Memory → History*

- *Imagination → Arts*
- *Reason → Science* |

  | **Modern Example** | **Melvil Dewey's DDC (1876)** — divides knowledge by discipline, not subject alone. |

  | **Strength** | Supports effective **information retrieval** and reflects **academic organization** in universities. |

Examples

1. **History (Memory)** — Knowledge of the past.
2. **Arts and Literature (Imagination)** — Creative and aesthetic expression.
3. **Science (Reason)** — Empirical and logical inquiry.
4. **Dewey Decimal Classification** — divides by disciplines like 300 = Social Sciences, 500 = Pure Sciences, 600 = Technology.
5. **University faculties** organized by discipline — Humanities, Sciences, Social Sciences, etc.
6. **Interdisciplinary studies** showing overlap yet discipline-based organization, e.g., Cognitive Science.

12.5 Comparative Overview of the Four Principles

Principle	Basis	Focus	Example System
Ideological	Cultural / Political / Religious worldview	Values and beliefs	BBK (Marxism), Medieval Christian systems
Social Purpose	Utility for society	Moral, practical, or spiritual use	Vedic classification (Dharma–Artha–Kama–Moksha)
Scientific Order	Natural / Logical sequence	Evolutionary or integrative structure	Expansive, Bliss, Colon Classification
Disciplinary	Academic and logical division	Organized fields of study	Dewey Decimal, LCC, university curricula

12.6 Relevance to Knowledge Organization

Aspect	Explanation
Dynamic Application	These principles guide how we structure knowledge systems for changing societies.
Foundation for Classification	Serve as theoretical bases for library and information classification schemes.
Cultural Adaptability	Reflect the need to modify systems (like DDC) for non-Western knowledge.
Information Retrieval	Help design logical, user-oriented subject access systems.
Intellectual Mapping	Support visualization of interconnections among disciplines.
Historical Understanding	Reveal how social context influences the structure of knowledge.

Examples

1. Revising **DDC schedules** to include Indian and African subjects.
2. Applying **integrative level theory** in modern knowledge graphs.
3. Mapping **disciplinary relationships** for digital repositories.
4. Designing **subject ontologies** that reflect cultural perspectives.
5. Structuring **academic libraries** around discipline clusters.
6. Using **social-purpose approaches** in public library collection planning.

13. MAPPING THE UNIVERSE OF KNOWLEDGE IN SOME GENERAL LIBRARY CLASSIFICATIONS

Different **library classification systems** attempt to map the universe of knowledge in distinct ways, each reflecting the **philosophy, cultural background, and intellectual climate** of its origin.

Here we look particularly at the **Dewey Decimal Classification (DDC)** and its universal version, the **Universal Decimal Classification (UDC)**.

13.1 DDC / UDC: Overview

Aspect	Description
Originator	**Melvil Dewey (1851–1931)** — introduced in 1876.
Underlying Philosophy	Based on **W. T. Harris's "Inverted Baconian Order,"** inspired by **Francis Bacon's division of knowledge** according to faculties of the human mind.
Structure	Divides the entire universe of knowledge into **10 main classes (0–9)**, arranged by **discipline**, not by subject.
Focus	Each discipline serves as a framework for grouping related subjects, implying that **a subject can appear in multiple classes**, depending on perspective.
Expansion	UDC (Universal Decimal Classification) — expanded form of DDC, developed by **Otlet and La Fontaine (1895)** for international use.

13.2 DDC: Three Great Divisions (Based on Mental Faculties)

Mental Faculty	Discipline	DDC Main Classes	Nature of Knowledge
Reason	Sciences	100–600	Logical, objective knowledge
Imagination	Arts & Literature	700–800	Creative and aesthetic expression
Memory	History	900	Record of past events

Preceding Class:

Class **0 (Generalia)** — Represents works of general nature, encyclopedias, and interdisciplinary subjects.

Examples of Main Classes

1. **000** – General Works, Computer Science, Information
2. **100** – Philosophy & Psychology
3. **200** – Religion
4. **300** – Social Sciences
5. **400** – Language
6. **500** – Pure Science
7. **600** – Technology (Applied Science)
8. **700** – Arts & Recreation
9. **800** – Literature
10. **900** – History & Geography

13.3 Mapping through DDC Hierarchy

The DDC maps knowledge hierarchically using **decimal fractions**, each digit adding a level of specificity.

It follows a **discipline-based tree structure**, allowing indefinite expansion.

Example	Hierarchical Level	Meaning
000–999	Universe of Knowledge	All fields of human inquiry
300	Social Sciences	A major discipline
330	Economics	A branch of social science
332	Financial Economics	Sub-branch
332.4	Money	Specific concept
332.42	Monetary Standards	Narrower concept
332.4222	Gold Coins	Most specific concept

Examples

1. 500 → Science
2. 510 → Mathematics
3. 512 → Algebra
4. 512.9 → Linear Algebra
5. 512.94 → Matrix Algebra
6. 512.942 → Determinants (deepest subdivision)

Feature:

Each added digit increases **specificity** (intension) and decreases **breadth** (extension).

13.4 Rigidity and Artificiality of Decimal Notation

Criticism	Explanation
1. Rigid Decimal Division	Knowledge does not naturally divide into ten parts; Dewey's decimal structure is arbitrary.
2. Notation Before Concept	Dewey chose his *notation first*, shaping subjects to fit it, instead of the reverse.
3. Procrustean Structure	Forces knowledge into a fixed pattern regardless of actual relationships.

4. Western-Centric Bias	Reflects 19th-century Western thought, over-representing Christianity and philosophy.
5. Faulty Groupings	Religion placed under "Reason"; Language separated from Literature; History separated from Social Sciences.
6. Limited Interdisciplinary Fit	Difficult to place new, cross-disciplinary subjects.

Examples of Classification Faults

1. **Religion (200)** under **Reason**, despite being faith-based.
2. **Language (400)** separated from **Literature (800)**, though closely related.
3. **History (900)** kept far from **Social Sciences (300)**.
4. **Computer Science (000)** originally under "General Works," not technology.
5. **Environmental Studies** scattered across sciences, geography, and policy.
6. **Information Science** divided between philosophy, technology, and social sciences.

13.5 Strengths and Advantages of DDC

Strength	Description
1. Simplicity and Universality	Easy to learn, understand, and apply globally.
2. Hierarchical Expansion	Can expand infinitely using decimal fractions.
3. Hospitality in Chain	New subjects can be inserted without rearranging the system.
4. Shelf Order Mechanization	Allows libraries to maintain orderly, logical physical arrangements.
5. Powerful Index	Subject index helps overcome rigid class order.
6. Basis for Future Systems	Served as a foundation for later systems (UDC, CC, BC).

Examples

1. Adding **.01–.09** for standard subdivisions (e.g., research, theory).
2. Expanding **Technology (600)** to accommodate new engineering fields.
3. Use of **auxiliary tables** for geographic or form aspects.
4. Adapting DDC to electronic databases.
5. **UDC** expanding DDC through symbols (+, :, /).
6. **Online DDC 23rd edition** supporting metadata tagging.

13.6 Dewey's Practical Approach

Aspect	Description
Goal	To create a practical, expandable, and simple shelf classification for libraries.
Philosophy	Pragmatic — focused on usability, not deep theory.
Achievement	Provided an enduring framework for arranging, retrieving, and updating knowledge.
Legacy	Became a model for later systems, including **UDC, LCC, and CC**.

Examples

1. **Decimal notation** still used worldwide.
2. **Adaptations in UDC** allow better international applicability.
3. **Colon Classification** took inspiration but moved beyond decimal rigidity.
4. **Electronic DDC** now integrated into OPAC systems.
5. **Library software** (like Koha) embeds DDC fields.
6. **National libraries** (e.g., Library of Congress, British Library) reference DDC in metadata.

14. MAPPING THE UNIVERSE OF KNOWLEDGE IN CUTTER'S AND J. D. BROWN'S CLASSIFICATIONS

Both **C. A. Cutter** and **J. D. Brown** made important contributions to the development of library classification theory after Dewey.

They sought to overcome DDC's rigidity and propose more logical, evolutionary, and user-oriented systems.

14.1 Cutter's Expansive Classification (1891–1893)

Aspect	Description
Creator	**Charles Ammi Cutter (1831–1903)**
Period	Late 19th century (contemporary of Dewey)
Purpose	To create a flexible, evolutionary, and practical classification system adaptable to libraries of all sizes.
Notation	Alphabetical letters (A–Z), avoiding decimal rigidity.
Principle	Based on **evolutionary order of knowledge** — from simple to complex, following nature's progression.

Main Classes

Symbol	Class / Discipline
A	Generalia works
B–D	Philosophy and Religion
E–G	History and Geography
H–K	Social Sciences
L	Sciences and Arts
M–Q	Biosciences and Medicine
R–V	Useful Arts, Technology, War, Athletics
W	Fine Arts
X–Y	Language and Literature
Z	Book Art (Library Science, Bibliography)

Key Features

Feature	Explanation
Evolutionary Order	Subjects arranged according to their natural development and scientific sequence.
Alphabetic Notation	Avoids DDC's decimal rigidity.
Practical Orientation	Arranged to bring together books that users may consult simultaneously.
Conceptual Depth	Based on the belief that book classification mirrors knowledge classification.
Influence	Inspired later systems, notably the **Library of Congress Classification (LCC)**.

Examples of Evolutionary Order

1. **Science** proceeds from **atoms → molecules → matter → life**.
2. **Botany** arranged from **cryptogams → phanerogams**.
3. **Economics** arranged from **population → production → distribution → property → consumption**.

4. **Book Arts** follow the sequence: **Production → Distribution → Storage (Library) → Description (Bibliography)**.
5. **Natural History** proceeds according to biological evolution.
6. **War and Athletics** represent advanced social and physical activities in human development.

Strengths of Cutter's System

1. **Evolutionary logic** made subject order meaningful.
2. **Alphabetic notation** provided flexibility.
3. **User-centered organization**—related books collocated.
4. **First system** to merge knowledge order with shelf order.
5. **Influenced LCC**, which borrowed much of its structure.
6. **Recognized need** for classification beyond mere arrangement.

Limitations

1. Lacked a strong theoretical framework compared to later systems.
2. Could not adapt easily to large libraries or emerging disciplines.
3. Too dependent on alphabetical notation for precision.
4. No provision for multi-disciplinary subjects.
5. Eventually became obsolete due to the rise of LCC and CC.
6. Evolutionary order occasionally subjective or inconsistent.

14.2 J. D. Brown's Subject Classification (1906, rev. 1917 & 1939)

Aspect	Description
Creator	**James Duff Brown (1862–1914)**
Period	Early 20th century
Goal	To collocate all aspects of a subject in one place, overcoming DDC's scattering by discipline.
Principle	Based on **"one-place theory"** — every subject and its related aspects (practical, theoretical, technical) should be together.
Structure	Claimed to follow a **scientific progression** or evolutionary order of creation.

One-Place Theory

Concept	Explanation
Definition	A concrete subject should occupy a single location, and all its related aspects should be grouped around it.
Contrast with DDC	DDC scatters subjects by discipline (e.g., Chemistry, Economics), while Brown's SC gathers them together.
Objective	To make it easier for users to find *all information about a single topic in one place*.

Example: Copper (Concrete Subject)

Aspect	Example Placement
Metallurgy	Physical extraction process
Mineralogy	Natural occurrence
Chemistry	Atomic and molecular properties
Conductivity	Electrical characteristics
Economics	Market and trade of copper

All aspects placed together under one heading: "Copper."

Example: Apple

Placed under **Botany**, along with:

- Apple cultivation, nutrition, diseases, and commercial uses — all gathered in one place.

Key Features

Feature	Description
Concrete-Subject Focus	Subject as the nucleus of organization.
Scientific Progression	Arranged from simpler to more complex fields of knowledge.
Practical Orientation	User-centered, emphasizing ease of access.
Innovation	First to apply the "collocation" concept (later refined by Ranganathan).
Influence	Inspired later experiments in subject-based and faceted classifications.

Examples of Scientific Progression

1. **Physical Sciences → Life Sciences → Social Sciences → Humanities**.
2. **Chemistry → Biology → Psychology → Sociology → Politics.**
3. **Minerals → Plants → Animals → Humans → Society → Culture.**
4. **Matter → Life → Mind → Society → Civilization.**
5. **Individual → Family → Community → State → Humanity.**
6. **Natural world → Technological world → Moral world.**

Criticism of Brown's System

Weakness	Explanation
Illogical Results	"Body exercises" and "body funeral" appeared together.
Lack of Theoretical Base	Overemphasis on concrete subjects ignored abstract relationships.
Limited Scalability	Difficult to expand for complex or interdisciplinary subjects.
Ambiguity in Placement	Choosing a dominant subject often subjective.
Failed Practical Implementation	The system was too complex for everyday library use.
Superseded by Ranganathan's Colon Classification (CC)	CC refined many of Brown's ideas with theoretical rigor.

Significance and Legacy

1. **Pioneered the idea** of subject collocation (precursor to faceted classification).
2. Emphasized **user-centered access** to knowledge.
3. Highlighted need for **logical subject sequence** beyond shelf order.
4. Exposed the limitations of rigid discipline-based systems.
5. Influenced **Ranganathan** and the **Classification Research Group (CRG)** in later decades.
6. Marked a **transitional phase** from traditional to modern classification theory.

14.3 Comparative Summary: Cutter vs. Brown

Aspect	Cutter's Expansive	Brown's Subject Classification
Period	Late 19th century	Early 20th century
Core Principle	Evolutionary order of knowledge	One-place theory (collocation)
Notation	Alphabetical (A–Z)	Numeric and symbolic
Organization	By discipline	By concrete subject

Orientation	Evolutionary and scientific	Practical and user-centered
Influence	On Library of Congress Classification	On Ranganathan's Colon Classification
Outcome	Historically significant, but obsolete	Experimental, failed in practice but conceptually influential

15. MAPPING THE UNIVERSE OF KNOWLEDGE IN COLON CLASSIFICATION (CC)

Colon Classification (CC), developed by **Dr. S. R. Ranganathan (1892–1972)**, was first published in **1933**.

It is the **first fully faceted, theory-based library classification** and represents a major leap from earlier enumerative systems like DDC and Cutter's Expansive Classification.

For Ranganathan, **order** — both among main classes and within subject facets — was the **essence of classification**.

He viewed classification not just as an arrangement of books but as a **living map of knowledge** that evolves with human thought.

15.1 Nature and Foundation of Colon Classification

Aspect	Description
Type	Faceted, analytico-synthetic, and theory-based system.
First Edition	1933; 7th Edition (1987) finalized posthumously.
Structure	Knowledge divided into **Main Classes** and **Facets**.
Notation	Mixed notation using **colon (:)**, which gives the scheme its name.
Order Principle	Based on **logical sequence, concreteness, and application.**
Philosophy	Scientific, not religious or ideological; though spirituality is given a unique place.

Examples

1. CC is **faceted** — each subject is analyzed into fundamental aspects (facets).
2. **Dynamic system** — accommodates new knowledge easily.
3. **Analytico-synthetic** — subjects are analyzed (broken) and then synthesized.
4. **Order-conscious** — precise rules govern every class and sub-class sequence.
5. **Theoretical foundation** — based on postulates, canons, and principles.
6. **Indian contribution** — world's first major classification from a non-Western scholar.

15.2 Main Class Structure

Ranganathan divided the universe of knowledge into **42 main classes** (in later editions), broadly grouped into:

Group	Range	Description
Sciences	A–M	Natural, physical, and applied sciences.
Humanities	N–S	Philosophy, religion, fine arts, literature, and linguistics.
Social Sciences	T–Z	Economics, politics, sociology, education, law, etc.
Special Class (Δ)	D	Mysticism and Spiritual Experience — the apex of the triangle.

Theoretical Order of Main Classes

Section	Nature of Knowledge	Order Principle
A–M (Sciences)	From abstract to concrete	Increasing concreteness
N–S (Humanities)	From simple to richer contents	Increasing expressiveness

T–Z (Social Sciences)	From natural to artificial	Increasing artificiality
Δ (Spiritual Knowledge)	Sum and source of all knowledge	Placed at the apex of the triangle

Examples

1. **B Mathematics** – most abstract science.
2. **C Physics** – more concrete than Mathematics, applied in Engineering.
3. **D Engineering** – applied physical sciences.
4. **E Chemistry → F Technology** – theory–practice alternation.
5. **I Botany → J Agriculture** – natural theory–practice pair.
6. **M Useful Arts** – most concrete of the sciences (e.g., Textile Engineering, Games, Carpentry).

15.3 The Triangular Representation of Knowledge

Ranganathan visualized the **universe of knowledge as a triangle**:

- **Δ (Delta)** — Mysticism and Spiritual Experience — at the vertex.
- **Sciences (A–M)** — the base of concrete, empirical knowledge.
- **Humanities (N–S)** — expressive and interpretive domains.
- **Social Sciences (T–Z)** — human-made, artificial systems.

Examples

1. **DΔ Spiritual Knowledge** at apex = highest form of awareness.
2. **Physics–Engineering–Technology** cluster at science base.
3. **Philosophy–Arts–Literature** forming the humanities wing.
4. **Economics–Politics–Law** forming the social sciences side.
5. The triangle reflects **balance between material and spiritual** pursuits.
6. Emphasizes that **all knowledge is interconnected**.

15.4 Theory–Practice Alternation (Serial System)

Ranganathan followed **Auguste Comte's principle of theory and practice alternation** — theoretical disciplines are followed by their applied counterparts.

Sequence	Example
B → C → D	Mathematics → Physics → Engineering
E → F	Chemistry → Technology
I → J	Botany → Agriculture
Theory → Application	Each pure science followed by its practical counterpart.

Examples

1. **Physics applied in Engineering.**
2. **Botany applied in Agriculture.**
3. **Chemistry applied in Technology.**
4. **Mathematics applied in Physics.**
5. **Pure vs. Applied sciences kept adjacent.**
6. **Integration of theory and utility** improves subject proximity for retrieval.

15.5 PMEST: Fundamental Categories of Knowledge

Category	Meaning	Order (Decreasing Concreteness)
P	Personality (Thing studied)	Most concrete
M	Matter (Material of the thing)	
E	Energy (Action or process)	
S	Space (Location)	
T	Time (Period)	Most abstract

This **PMEST sequence** forms the **facet formula** for building compound subjects.

Examples

1. "**Library service to students in India in 2020**"
    - Personality: Library
    - Energy: Service
    - Matter: Students
    - Space: India
    - Time: 2020
2. Each facet connected by colon (:) in the class number.
3. Subject number shows **increasing specificity**.
4. Facets represent **logical hierarchy of ideas**.
5. Ensures **helpful sequence** for arrangement.
6. Adopted by later systems like UDC and Bliss.

15.6 Principles of Sequence and Order

Principle	Description
Principle of Inversion	Shelf order moves from abstract → concrete; general → specific.
Principle of Helpful Sequence	Ensures the order of subjects on shelves is user-friendly.
Wall-Picture Principle	Arrangement from general to specific resembles a wall painting (broad to narrow).
Cow–Calf Principle	Applied subjects follow their parent pure subjects.
Round-and-Level Sequence	Organizes multiple facets in multi-layered subjects.

Examples

1. "**Physics : Optics : Light : Polarization**" follows Wall-Picture Principle.
2. "**Botany : Agriculture**" illustrates Cow–Calf Principle.
3. **Engineering** follows **Physics** — Theory–Practice sequence.
4. **Library : Cataloguing : Subject Indexing** = Round-and-Level sequence.
5. **General → Specific order** helps in shelving.
6. **Helpful Sequence** minimizes user confusion in retrieval.

15.7 APUPA Pattern

Term	Meaning
A	Alien subjects (unrelated)
P	Penumbral subjects (related marginally)
U	Umbral subjects (main subject cluster)
P	Penumbral again

A	Alien again

This pattern ensures **smooth transitions** between related and unrelated subjects on library shelves, reducing abrupt shifts.

Examples

1. **Mathematics (U)** surrounded by **Physics (P)** and **Philosophy (A)**.
2. **Botany (U)** flanked by **Zoology (P)** and **Chemistry (A)**.
3. **Library Science (U)** adjacent to **Education (P)** but away from **Engineering (A)**.
4. **Economics (U)** with **Sociology (P)** and **Law (A)** nearby.
5. Promotes **contextual continuity** on shelves.
6. Facilitates **logical browsing** by users.

15.8 Significance and Influence

Contribution	Explanation
Faceted Analysis	Introduced analytical decomposition of subjects into facets.
Dynamic Structure	Adaptable to future knowledge growth.
Scientific Foundation	Based on postulates, canons, and laws of library science.
Indian Contribution	First systematic classification from the Global South.
Influence	Inspired **Bliss BC2**, **CRG**, **Facet Analysis**, **Knowledge Organization research**.
Modern Use	Forms the base of faceted web ontologies and digital classification.

Examples

1. **Faceted classification** in digital libraries and metadata systems.
2. **Ontology design** using PMEST logic.
3. **Knowledge graphs** applying Ranganathan's categories.
4. **CRG (Classification Research Group)** refining his theories.
5. **BC2 (Bliss Classification 2)** adopting facet principles.
6. **AI knowledge representation** based on hierarchical and relational facets.

16. MAPPING THE UNIVERSE OF KNOWLEDGE IN OTHER GENERAL LIBRARY CLASSIFICATIONS

The 20th century saw several major attempts to **map the universe of knowledge** through different classification systems.

Each reflects a particular **philosophy, institutional context, and practical goal**, from the pragmatic **LCC** to the theoretically grounded **Bliss BC** and the experimental **Rider's IC**.

16.1 Library of Congress Classification (LCC)

Aspect	Description
Origin	Began in **1897**; first outline (Class Z) appeared in **1904**.
Developers	**J. C. M. Hanson** and **Charles Martel**; influenced by **Cutter's Expansive Classification**.
Nature	**Discipline-based**, but primarily a **book classification**, not a universal knowledge system.
Notation	**Alphanumeric** (A–Z + numbers).
Basis	Built on **literary warrant** — actual holdings of the Library of Congress.
Structure	21 main classes expanded into 40 + schedules.
Philosophy	**Pragmatic**, flexible, and collection-specific.

Main Class Overview

Range	Discipline / Subject Area
A	General Works
B–D	Philosophy, Psychology, Religion
E–F	History of the Americas
G	Geography, Anthropology, Recreation
H	Social Sciences
J	Political Science
K	Law
L	Education
M	Music
N	Fine Arts
P	Language and Literature
Q	Science
R	Medicine
S	Agriculture
T	Technology
U–V	Military and Naval Science
Z	Bibliography, Library Science, Information Resources

Key Characteristics

Feature	Explanation
1. Literary Warrant	Built on LC's actual collection rather than theoretical logic.
2. Pragmatism	Designed for shelf arrangement, not for philosophical order.
3. Discipline-based	Mirrors university departments and research areas.
4. Alphanumeric Notation	Simple, expandable, and flexible.
5. Progressive Specificity	Subclasses arranged from general to specific.
6. Local Adaptation	Tailored to LC's building layout and collection structure.

Examples

1. **B – Philosophy**
2. **H – Social Sciences**
3. **Q – Science**
4. **R – Medicine**
5. **T – Technology**
6. **Z – Bibliography and Library Science**

Criticism

- Lacks a universal theoretical framework.
- Uneven depth across classes.
- Reflects Western academic biases.
- Developed primarily for LC, not for all libraries.

Significance

- Most **widely used system** in academic and research libraries.

- Highly **flexible** and **accommodative**.
- **Influenced by Cutter's Expansive Classification** in both structure and notation.

16.2 Bibliographic Classification (BC) — Henry Evelyn Bliss (1940–1953)

Aspect	Description
Creator	**H. E. Bliss (1870–1955)**
Nature	A **logical, theoretically grounded, enumerative system**.
Philosophy	Based on **"scientific and educational consensus"** — the order of knowledge reflects the majority view of the academic world.
Notation	**Mixed letters and numbers**.
Structure	Subjects arranged according to **natural and logical relationships**.

Order of Main Classes (Simplified)

Symbol	Subject Area
A	Philosophy
AM	Mathematics
B–C–D	Physics, Chemistry, Astronomy
E–G	Biology
H–J	Anthropology, Psychology, Education
K–O	Social Sciences, History
P–S	Religion, Political Science, Law
T–V	Economics, Technology, Fine Arts
W–Y	Language and Literature
Z (Alt)	Religion (alternate placement)

Key Principles

Principle	Explanation
Scientific & Educational Consensus	The order reflects the way educated communities perceive relations among disciplines.
Collocation & Subordination	Related subjects (pure and applied) are placed together.
Alternative Locations	Subjects may appear in multiple logical positions (e.g., Economic History under Economics or History).
Stability & Logic	Strives for a rational, stable, and comprehensible hierarchy.

Examples

1. **Biology → Medicine** placed side by side.
2. **Chemistry → Chemical Technology** kept together.
3. **History ↔ Economics** share overlap through Economic History.
4. **Philosophy → Religion** transition logically by abstraction.
5. **Fine Arts → Literature** grouped under Humanities.
6. **Social Welfare → Political Science** continuity maintained.

Criticism

- **"Consensus theory"** assumes a permanent natural order — not realistic.
- Provision of **alternative locations** weakens hierarchical clarity.
- Difficult for automation and global standardization.

Significance

- Offers one of the **most logical and stable main-class orders**.
- Anticipated **facet relationships** and **subject collocation** ideas later refined by the **Classification Research Group (CRG)**.
- Influenced **Bliss Bibliographic Classification, 2nd Edition (BC2)** — a faceted revision aligned with modern theory.

16.3 Rider's International Classification (IC)

Aspect	Description
Creator	**Fremont A. Rider (1885–1962)**
Published	**1961** — self-published experimental system.
Nature	Broad, enumerative classification with **26 main classes** (A–Z).
Purpose	Intended for the arrangement of books in **general libraries worldwide**.
Notation	**Roman capitals** (A–Z), further subdivided alphabetically up to three letters ($26^3 = 17{,}576$ possible classes).

Main Classes (Simplified)

Range	Subject
A	Generalia
B	Philosophy and Psychology
C–I	History and Geography
J–N	Social Sciences
O	Business and Industry
P	Military Science
Q–S	Physical Sciences and Technology
T–V	Biology, Medicine, Agriculture
W	Fine Arts, Music
X–Z	Language and Literature

Characteristics

Feature	Explanation
Broad Coverage	Simple, all-inclusive structure with few divisions.
Non-Revisable	Rider claimed a broad scheme needs no revision.
Enumerative	Lists subjects rather than analyzing them.
Lack of Theory	No philosophical or scientific order of subjects.
Order	Roughly: Social Sciences → Sciences → Humanities.
Notation Flexibility	Alphabetic sequences allowed large expansion.

Examples

1. **A – General Works** (encyclopedias, miscellany).
2. **J – Sociology**, **N – Economics** under Social Sciences.
3. **Q – Physics**, **S – Technology** under Sciences.
4. **T – Biology**, **U – Medicine**, **V – Agriculture**.
5. **W – Fine Arts**.
6. **X–Z – Literature and Language**.

Criticism

- Lacked a coherent theoretical basis.
- Too broad for modern, growing knowledge.
- No provision for compound or interdisciplinary subjects.
- Enumerative approach obsolete amid faceted developments.
- Never implemented in any major library.
- Considered **"stillborn"** — an unadopted experiment.

Significance

- Represents an **intermediate stage** between enumerative and faceted thinking.
- Illustrates the **limitations of one-dimensional systems** during the mid-20th century.
- Serves as a cautionary example for later knowledge-organization theorists.

16.4 Comparative Overview

Feature	LCC	BC (Bliss)	IC (Rider)
Type	Practical, literary-warrant, enumerative	Logical, theoretical, semi-enumerative	Broad, enumerative
Basis	Discipline and LC collection	Scientific-educational consensus	Alphabetic broad order
Notation	Alphanumeric	Mixed letters/numbers	Roman capitals
Philosophy	Pragmatism	Rational order of knowledge	Simplistic generalization
Flexibility	High (expandable)	Moderate	Low
Theoretical Depth	Minimal	High	None
Influence	Widely used globally	Influenced BC2 and CRG	Historically insignificant

17. MAPPING THE UNIVERSE OF KNOWLEDGE IN THE BBK (LBC) AND BSO SYSTEMS

After the major Western systems (DDC, CC, LCC, BC), two important post-war systems emerged in Europe:

1. **Bibliothecal Bibliographic Klassification (BBK / LBC)** — developed in the USSR.
2. **Broad System of Ordering (BSO)** — developed later under UNESCO for global interoperability.

Both were born in different ideological contexts — **BBK** in a socialist scientific culture, and **BSO** in an international collaborative framework.

17.1 Bibliothecal Bibliographic Klassification (BBK / LBC)

Aspect	Description
Full Name	Bibliotechno-Bibliograficheskaya Klassifikatsiya (BBK), in English "Library Bibliographic Classification"
Country / Origin	Soviet Union (Russia)
Developed At	**Lenin State Library, Moscow**
Publication	Main schedules: **1960–1968** (30 volumes)

Abridged Editions	6-volume (1970–1975); 1-volume (1976)
Notation	**Cyrillic alphabets (28)**; later supplemented by **decimal numerals (1/9 system)**
Structure	**Hierarchical and partly faceted**
Main Feature	**Marxism–Leninism** as the theoretical foundation; order reflects **social utility and ideological priority**

17.1.1 Outline of Main Classes

Code	Subject Area
1	General and Interdisciplinary Knowledge
2	Physical and Biological Sciences
3	Technology
4	Agriculture and Forestry
5	Public Health and Medicine
6	Social Sciences and Military Art
7	Culture and Education
80–84	Language and Literature
85	Art
86	Religion and Atheism

17.1.2 Key Characteristics

Feature	Explanation
1. Ideological Basis	Built around **Marxism–Leninism**, which occupies the first position in every class.
2. Social Utility Principle	Order of disciplines reflects their **perceived usefulness to society**.
3. Hierarchical + Faceted	Allows synthesis through subdivisions similar to **UDC**.
4. Pedagogical Order	Arrangement follows **educational sequence** — from fundamental to applied.
5. Applied Sciences as Bridges	Technology, agriculture, and medicine connect science with society.
6. Bilingual Notation	Since 1977, supplemented with **1/9 decimal equivalents** for global interoperability.

17.1.3 Knowledge Structure Logic

Segment	Order Principle
Sciences (1–5)	From basic → applied → life-related (e.g., medicine).
Social Sciences (6)	Political, economic, and military emphasis.
Culture & Humanities (7–86)	Focus on education, art, and literature.
Religion	Placed last — regarded as least factual or scientific.

17.1.4 Examples

1. **2** – Physical and Biological Sciences.
2. **3** – Technology and Engineering.
3. **4** – Agriculture and Forestry (linking science and economy).

4. **5** – Medicine and Health Sciences.
5. **6** – Social Sciences and Military Arts.
6. **86** – Religion and Atheism (placed at the end, ideologically).

17.1.5 Evaluation of BBK

Strengths	Limitations
• Hierarchical, structured, and comprehensive.	• Strong ideological bias (Marxism–Leninism).
• Bridges pure and applied sciences logically.	• Limited adaptability outside USSR context.
• Adaptable for printed, electronic, and OPAC systems.	• Complex notation for international use.
• Rich in detailed classes (≈45,000).	• Too culturally embedded for universal adoption.
• Effective in science and technical libraries.	• Now partially outdated in post-Soviet context.

17.1.6 Significance

1. Major **state-sponsored knowledge map** of the socialist world.
2. Balanced structure between **science, technology, and culture**.
3. Precursor to **post-ideological knowledge models** in modern Russia.
4. Provided **foundation for specialized Russian digital classifications**.
5. Influenced later **UNESCO and IFLA** interoperability efforts.
6. Remains a **unique socio-political document** of knowledge organization.

17.2 Broad System of Ordering (BSO)

Aspect	Description
Full Name	Broad System of Ordering
Developed By	UNESCO (1971), elaborated for FID by **Eric J. Coates**, **G. Lloyd**, and **D. Simandi**
Purpose	To serve as a **roof or umbrella classification** for science and technology — ensuring **interoperability** between systems (UDC, LCC, DDC, etc.).
Nature	**Switching language** for connecting multiple indexing and retrieval systems.
Versions	1st (1971): 4,000 classes → 3rd (latest): 6,800 classes (electronic form).
Notation	**Decimal, centesimal, and millesimal** — allowing horizontal and vertical expansion.

17.2.1 Knowledge Structure

- **Cyclic and continuous**, unlike linear systems.
- Knowledge begins with **applied subjects** and circles back to abstract and esoteric ones.
- Arranged **clockwise in a circle**, forming a **conceptual continuum**.

Position on Circle	Subject Cluster
Left-bottom	Logic, Mathematics, Research Methods
Left Arc	Life Sciences, Sports Sciences
Top Arc	Science, Education, Human Needs
Right Arc	Humanities, Social Sciences, Technology
Right-bottom	Religion, Esoteric Practices (least verifiable knowledge)

17.2.2 Notation Examples

Example	Description

970-140	Information services in religion
970-182	Research in religion
340, 480	Life and Sports Sciences (facet combination using commas)
600, 500	Humanities and Technology clusters

17.2.3 Key Features

Feature	Explanation
1. Cyclic Order	Knowledge represented as a **closed loop**, not a hierarchy.
2. Facet Synthesis	Compound subjects created using **hyphen and comma** notation.
3. Integration-Oriented	Designed for **inter-system compatibility** (bridging UDC, DDC, CC, etc.).
4. Multidisciplinary	Includes traditional and mission-oriented subjects.
5. Scalable	Can expand vertically (depth) or horizontally (breadth).
6. Post-Ranganathan Influence	Incorporates **facet principles** from **Ranganathan** and **CRG**.

17.2.4 Examples

1. **112** – Logic and Mathematical Research Methods.
2. **340** – Life Sciences cluster.
3. **480** – Sports Sciences.
4. **500** – Humanities and Social Sciences.
5. **600** – Technology and Applied Sciences.
6. **992** – Esoteric Practices (placed at the end of the cycle).

17.2.5 Evaluation of BSO

Strengths	Limitations
• Integrative, flexible, and interdisciplinary.	• Complex for general library use.
• Designed for **interoperability** between systems.	• Limited public documentation and adoption.
• Reflects **modern scientific worldview**.	• Overly generalized for deep classification.
• Cyclic model shows **continuity of knowledge**.	• Lacks user-centered simplicity.
• Facet synthesis encourages precision.	• Used mostly by research and indexing agencies.

Unit 2 – Bibliographic Description

1. Introduction

If the **library is the heart** of an institution, then the **catalogue is the pulse** that keeps it functioning.

As collections grow, catalogues become essential tools to **locate, identify, and access** materials efficiently.

Key Points

- A **catalogue** is the **key to the library's holdings**, showing what materials exist and where they can be found.
- It helps readers **navigate the "ocean of books."**
- Catalogues **interpret and represent** documents for user access.
- It acts as a **bridge** between documents and users.

Functions in Context

- Represents the **total intellectual content** of a library.
- Helps users discover **what exists** and **how to obtain it.**
- Essential for **information retrieval** and **resource exploitation.**

Examples

1. A student searches the catalogue for *"History of Modern India."*
2. A researcher locates journals on *Artificial Intelligence.*
3. A librarian checks whether *"Encyclopaedia Britannica"* is available.
4. A user browses subject entries for *Renewable Energy.*
5. A faculty member searches by *author name* "Amartya Sen."
6. An online catalogue (OPAC) shows all *ebooks* on Data Science.

2. Definition

The word **Catalogue** comes from **Greek: "Kata" (according to) + "Logos" (order)** — meaning **arrangement in a specific order.**

It refers to an **organized list of documents** following a definite plan.

2.1 Major Definitions

Author / Source	Definition / Key Idea
C. A. Cutter (1876)	"Catalogue is a list of books arranged on some definite plan. It is a list of books in some library or collection."
J. D. Brown	"An explanatory, logically arranged inventory and key to the books and their contents, confined to one library."
H. A. Sharp	"A list of books and other materials in a library or group of libraries arranged by a definite plan."
S. R. Ranganathan (1938)	"A tool giving information about the contents of the library, arranged by subject and author to help readers find books quickly."
Oxford English Dictionary	"A systematic or methodical list arranged alphabetically or otherwise, often with brief descriptive particulars."

2.2 Essential Features

- Systematically arranged.
- Confined to a **particular library or collection.**
- Provides **bibliographic details** (author, title, edition, publisher, year, etc.).
- Differs from **bibliography**, which covers books on a topic across libraries.

Examples

1. **Dictionary Catalogue** — entries arranged alphabetically (e.g., by author, title, subject).
2. **Classified Catalogue** — arranged by subject classification (e.g., DDC or CC numbers).
3. **Union Catalogue** — lists holdings of several libraries together.
4. **Author Catalogue** — shows all works by a specific author.
5. **Title Catalogue** — lists works alphabetically by title.
6. **Subject Catalogue** — lists materials by subject headings.

3. Functions of Library Catalogue

The **primary function** of a catalogue is to **help readers exploit library resources effectively** by locating and identifying materials.

3.1 Cutter's Classical Functions (1876)

Function	Description
1. Find	To enable a person to find a book if the author, title, or subject is known.
2. Show	To show what the library has by a given author, on a given subject, or in a given kind of literature.
3. Assist	To assist in the choice of a book as to edition, literary or topical character.

3.2 Margaret Mann's View

- Catalogue introduces **order** into a collection.
- Enables easy **reference and circulation.**

3.3 Ranganathan's Functional View

Based on the **Five Laws of Library Science**, Ranganathan described the catalogue as a **tool for fulfilling these laws.**

Function	Relation to Five Laws
(a) To disclose every reader his/her document	Every reader his/her book.
(b) To secure for every document its reader	Every book its reader.
(c) To save the time of the reader	Save the time of the reader.
(d) To save the time of the staff	Save the time of the staff.

He emphasized **bipartite catalogues** (Alphabetical + Classified parts) to achieve quick retrieval.

3.4 Reader Queries a Catalogue Must Answer

1. Is a particular book available in the library?
2. Which books by a specific **author** are available?
3. Which books exist with a particular **title**?
4. Which works involve a **collaborator** (editor, translator, compiler, etc.)?
5. Which books belong to a particular **series**?

6. What materials exist on a specific **subject**?

3.5 Overall Functions (Summarized)

- Identify and locate documents.
- Display the **scope of library holdings.**
- Serve as an **index** to the library collection.
- Save the **time of users and staff.**
- Facilitate **resource discovery and retrieval.**
- Support **bibliographic control.**

Examples

1. Catalogue helps a user locate *"Principles of Economics"* by Alfred Marshall.
2. A reader finds all works on *Renewable Energy* using subject entries.
3. A researcher identifies the *latest edition* of a textbook.
4. A librarian retrieves *series publications* under one heading.
5. A staff member answers, "Does the library have this book?" using OPAC.
6. A user checks publication details for citation formatting.

4. Importance of Library Catalogue

A library catalogue is the most essential tool for locating and identifying books and other materials. Without it, a library is like a person without eyes or a house without windows — existing, but blind to its own contents.

4.1 Importance in Open Access System

In the past, libraries followed the *closed access system*, where readers could not enter the stack room. The catalogue was the only tool for finding out what books existed.

In the *open access system* of today, readers can browse the shelves themselves, but that doesn't reduce the importance of the catalogue — it increases it.

Because many popular books are often issued, the catalogue helps the reader know whether the library owns the book or if it is currently borrowed.

If the catalogue shows that the book exists, the user can reserve it and be notified when it is returned.

Examples:

1. A student checks the catalogue to see if a book is issued or available.
2. A reader reserves a book already borrowed by someone else.
3. A librarian uses the catalogue to find books on a topic.
4. The catalogue helps track books issued, lost, or replaced.
5. The catalogue shows available formats — print, digital, or audio.
6. In large libraries, catalogues prevent confusion and save time.

4.2 Importance When Books Are Arranged by Classified Order

It is a misconception that if books are properly arranged on shelves according to classification, a catalogue is not needed.

According to Sharp, *"Catalogue is a complement of classification."*

Classification provides only one approach — by subject — and that too is incomplete for books dealing with more than one topic.

The catalogue, on the other hand, provides several approaches: by author, title, collaborator, series, or subject.

Examples:

1. A book on Political and Economic History belongs to two subjects — classification alone can't handle this well.
2. Readers looking for editors or translators need catalogue access.
3. A user can search by series title through the catalogue.
4. The catalogue links books across related subjects.
5. It supports searching by author name, which classification cannot.
6. Both catalogue and classification together provide full access.

4.3 Indispensable Tool for Other Library Sections

The catalogue is the pivot around which all other library activities revolve.

It is indispensable in the following operations:

1. **Reference service** – locating relevant works for users.
2. **Book selection** – identifying missing or new items.
3. **Classification** – assisting in correct subject analysis.
4. **Cataloguing** – maintaining consistent bibliographic data.
5. **Circulation** – tracking issues, returns, and reservations.
6. **Administration** – preparing reports, audits, and inventories.

As Edward Edwards stated in 1859:

"No matter connected with the administration of a public library can vie, in point of importance, with the character and condition of its catalogue."

A catalogue well maintained and up to date reflects the true quality of a library.

4.4 Famous Views on the Importance of Catalogue

- "A library without a catalogue is like a man without a name." – American Geographical Society (1865)
- "The catalogue reveals the glory of the librarian."
- "However large and well-selected a collection may be, without a good catalogue, it fails its purpose." – Edward Edwards
- "Catalogue is the key that opens the treasures of knowledge."
- "A good catalogue saves both time and labour for readers and staff."

5. Adjuncts to Library Catalogue

The word *adjunct* means something added or attached to another as a supplement.

In library science, adjuncts are tools that provide additional or supporting information to the catalogue.

Though similar in some ways, their functions are distinct.

Main adjuncts include:

1. Accession Register
2. Shelf List
3. Index
4. Bibliography

5.1 Library Catalogue and Accession Register

The accession register is a record of all volumes added to the library, arranged in the order of their receipt.

It includes details like date, accession number, author, title, publisher, year, price, source, and remarks.

Functions of Accession Register:

- Provides a complete record of every item added to the library.
- Maintains chronological record of the library's growth.
- Useful for preparing annual reports and statistics.
- Serves as proof for inventory, audit, and insurance purposes.
- Distinguishes between multiple copies of the same book.
- Indicates whether a book is available or withdrawn.

While the **accession register** is mainly a stock record, the **catalogue** helps in locating books through multiple access points such as author, title, or subject.

Examples:

1. Catalogue helps users locate a book; register helps staff verify when it was acquired.
2. Register provides price and supplier details.
3. Audit staff use it to verify stock.
4. Librarian prepares annual reports using register data.
5. Catalogue assists in finding; register assists in accounting.
6. Both together ensure complete control of library materials.

5.2 Library Catalogue and Shelf List

A shelf list is a record of books arranged in the same order as they stand on the shelves.

Each book is represented by a card showing author, title, edition, volumes, copies, and call number.

Purpose of Shelf List:

- Acts as a *mirror of the shelves* for staff use.
- Helps in checking physical arrangement and stock verification.
- Aids in detecting misplaced or missing books.

While the shelf list is mainly for internal control, the catalogue is for public access.

The shelf list may serve as a classified inventory, but lacks other approaches (author, title, etc.) that a catalogue provides.

Examples:

1. Shelf list helps staff trace misplaced books.
2. Catalogue helps readers find the same book by title.
3. Shelf list confirms the number of copies of a title.
4. It is used for annual stock checking.
5. Catalogue provides subject access; shelf list provides physical order.
6. Both together maintain intellectual and physical control.

5.3 Catalogue and Index

Although sometimes used interchangeably, catalogue and index perform different roles.

- A **catalogue** describes documents and their bibliographic details.
- An **index** locates specific information within a document or across documents.

According to E. J. Coates:

"A catalogue entry describes a document; an index entry merely locates the subject within it."

Examples:

1. Catalogue lists the book "Ancient History of India."
2. Index points to "Mauryan Empire – page 120."
3. Catalogue provides the author and edition details.
4. Index helps locate specific data quickly.
5. Catalogue helps users discover documents.
6. Index helps researchers find pinpoint information.

5.4 Catalogue and Bibliography

A **bibliography** is also a list of books or documents, but it is not confined to a single library.

It may cover an author, subject, or period and aims to guide readers to literature relevant to their study.

A catalogue lists what a library owns; a bibliography lists what exists.

Main Differences:

- Catalogue is limited to one library; bibliography covers all known works.
- Catalogue helps in locating documents; bibliography helps in discovering them.
- Catalogue provides shelf location; bibliography does not.
- Bibliography is used for research, selection, and reference.
- Both are arranged systematically, but their purposes differ.

Examples:

1. Library catalogue shows all books on Sociology in a library.
2. Bibliography lists all known books on Sociology worldwide.
3. Bibliography assists in book selection.
4. Catalogue assists in book location.
5. Bibliography helps in interlibrary loan.

6. Introduction of Normative Principles

In cataloguing, **normative principles** are the fundamental *laws, canons, and principles* that regulate the preparation of catalogue codes, structure of entries, choice of headings, and the methods of description.

Dr. S. R. Ranganathan (1892–1972) was the first to apply a **scientific approach** to cataloguing and to define a systematic set of normative principles. Between **1934–1938**, while developing the *Classified Catalogue Code (CCC)*, he formulated a group of canons that later became the foundation of modern cataloguing theory.

According to Ranganathan:

"These normative principles were not the same as the Five Laws of Library Science — they were their direct implications."

He used three key terms for these governing ideas — **Law, Canon, and Principle.**

7. The Three Levels of Normative Principles

Term	Meaning	Level of Application	Example
Law	A statement of universal truth governing an entire discipline.	Major / Foundational	Law of Parsimony, Law of Impartiality
Canon	A general rule or standard used to judge or guide cataloguing decisions.	First-order divisions	Canon of Consistency, Canon of Ascertainability
Principle	A procedural or methodological rule applied in practice.	Second or later-order divisions	Principle of Alphabetization, Principle of Local Variation

Explanation

- **Law** tells us what *must* or *must not* be done.
- **Canon** guides *how to judge* cataloguing decisions.
- **Principle** regulates *how to perform* cataloguing tasks.

Examples

1. Law of Parsimony → Keep catalogue entries concise and simple.
2. Canon of Consistency → Maintain uniformity across entries.
3. Canon of Ascertainability → Every detail must be verifiable.
4. Principle of Alphabetization → Arrange entries in standard alphabetical order.
5. Law of Impartiality → Avoid bias among authors or subjects.
6. Principle of Unity of Idea → Represent one concept uniformly throughout.

8. Historical Development of Normative Principles

The **normative principles** evolved through several stages of refinement, from **1934 to 1969**, each stage adding new canons or modifying earlier ones.

8.1 Formulation I (1938 – *Theory of Library Catalogue*)

This was the first stage where Ranganathan listed **six canons**, along with the **Law of Parsimony** as a guiding law.

No.	Canon Name	Description
1	Canon of Consistency	Uniformity should be maintained in cataloguing practice.
2	Canon of Relevance	Headings must relate to user needs and search behavior.

3	Canon of Ascertainability	Bibliographic information should be verifiable from the document itself.
4	Canon of Permanence	Headings should remain stable over time.
5	Canon of Currency	Entries should reflect up-to-date data.
6	Canon of Prepotence	The most significant element should take precedence in the main entry.

Accompanying Law: *Law of Parsimony* — "Prefer simplicity and economy of effort."

Examples

1. Same author's works use consistent heading style.
2. Select main heading by user search pattern.
3. Verify title, author, and edition directly from the book.
4. Avoid unnecessary changes to headings over time.
5. Update entries when editions change.
6. Give primary entry to the main author, not editor.

8.2 Formulation II (1955 – *Headings and Canons*)

Ranganathan expanded the canons from six to **eight**, renaming and adding some.

No.	Change / Addition	Description
1	Canon of Relevance → Canon of Sought Heading	Heading should match the term most likely sought by the user.
2	Added: Canon of Context	Heading should reflect the context and purpose of the work.
3	Added: Canon of Purity	Avoid mixing unrelated ideas within a single heading.

Complete List (1955):

1. Canon of Consistency
2. Canon of Sought Heading
3. Canon of Ascertainability
4. Canon of Permanence
5. Canon of Currency
6. Canon of Prepotence
7. Canon of Context
8. Canon of Purity

Examples

1. Headings use consistent form (e.g., "Shakespeare, William").
2. Reader searching by "Indian History" finds related works.
3. Details verified from title page, not assumptions.
4. Headings not frequently altered.
5. Edition updates reflected promptly.
6. Main entry always under most dominant author.
7. Context respected (e.g., "Church Architecture" under *Architecture* not *Religion*).
8. Avoiding mixed headings like "Education and Agriculture."

8.3 Formulation III (1964 – *Classified Catalogue Code, 5th Edition*)

This version **omitted the Canon of Purity** and **added the Canon of Individualization.**

It also introduced **six general laws** relevant to cataloguing.

Revised Canons (1964):

1. Canon of Consistency
2. Canon of Ascertainability
3. Canon of Permanence
4. Canon of Currency
5. Canon of Prepotence
6. Canon of Context
7. Canon of Sought Heading
8. Canon of Individualization

General Laws (1964):

- Law of Interpretation
- Law of Impartiality
- Law of Symmetry
- Law of Parsimony
- Principle of Local Variation
- Principle of Osmosis

Examples

1. Different authors' names represented uniformly (Consistency).
2. Verify bibliographic details directly from document (Ascertainability).
3. Stable headings maintained over time (Permanence).
4. Edition details kept up to date (Currency).
5. Choose heading by main author (Prepotence).
6. Heading suits document context (Context).
7. Entry aligns with user's search intention (Sought Heading).
8. Distinguish works of same author or title (Individualization).

8.4 Formulation IV (1969 – *Library Science with a Slant to Documentation*)

Ranganathan's final stage of development added one new canon and two new principles.

Type	Name	Description
Canon	Canon of Recall Value	Each entry must have high recall value — easily found when needed.
Principle	Principle of Unity of Idea	A single concept should have uniform representation across the catalogue.
Principle	Principle of Probability	Entries should be designed considering likelihood of user search terms.

Thus, by 1969, Ranganathan's cataloguing theory included:

- **9 Canons**
- **5 Laws of Library Science**

- **4 General Laws (Cataloguing)**
- **4 Principles**

9. Summary of Evolution

Stage	Year / Work	Additions / Changes	Total Canons
I	1938 – *Theory of Library Catalogue*	6 Original Canons + Law of Parsimony	6
II	1955 – *Headings and Canons*	Added: Context, Purity; Relevance → Sought Heading	8
III	1964 – *CCC, 5th Ed.*	Dropped: Purity; Added: Individualization	8
IV	1969 – *Library Science with a Slant to Documentation*	Added: Recall Value; 2 new Principles	9

Examples of Application of Normative Principles

1. **Library catalogues** that maintain uniform author headings apply the Canon of Consistency.
2. **Subject catalogues** use the Canon of Sought Heading to align with reader expectations.
3. **Authority files** reflect the Canon of Permanence by keeping heading stability.
4. **Revised editions** highlight the Canon of Currency in updating entries.
5. **Cross-references** demonstrate the Canon of Context.
6. **Unique identifiers (ISBNs)** support the Canon of Individualization

11. Need and Importance of Canons of Cataloguing

Cataloguing is one of the most important tools for the **organization and retrieval** of library materials.

To ensure accuracy, consistency, and uniformity, cataloguers need guiding rules — known as **Canons of Cataloguing** — which act as **scientific standards** for cataloguing practice.

11.1 Why Canons Are Needed

Cataloguing today faces several challenges:

- Enormous growth in publishing output.
- Non-standard and inconsistent title pages.
- Ambiguous or misleading editions.
- Complex and multidisciplinary subjects.
- Reprints and editions often confused on title pages.

Thus, a **set of well-defined principles** is required to guide cataloguers — just as a **lighthouse guides ships at sea** — to ensure **uniformity, precision, and reliability** in cataloguing work.

11.2 Importance of Canons in Cataloguing

Aspect	Importance
Consistency	Ensures all cataloguers follow uniform standards in all libraries.
Accuracy	Guides cataloguers to extract verified and authentic data.
Uniformity	Promotes identical cataloguing patterns across libraries and over time.
Interpretation	Helps in interpreting catalogue codes for new or unusual materials.
Evaluation	Provides a basis for analyzing and improving catalogue codes.

Scientific Basis	Transforms cataloguing from a mechanical activity into a reasoned, scientific process.

11.3 Functions of Canons

The canons are applied in four main areas of cataloguing work:

1. **Formulating Catalogue Codes** — to develop rules and procedures.
2. **Interpreting Rules** — for unusual documents or formats.
3. **Guiding Daily Cataloguing** — to ensure consistent practice.
4. **Critically Analyzing Catalogue Codes** — to assess effectiveness and suggest improvements.

11.4 Relation to the Five Laws of Library Science

The canons are **practical extensions** of Ranganathan's **Five Laws of Library Science**, but they apply specifically to **cataloguing**.

When a canon fails to resolve a problem, **the Five Laws** serve as the higher authority for guidance.

11.5 Scholarly Recognition

Prof. **Ganesh Bhattacharya** rightly observed:

"This set of normative principles of cataloguing is one of the outstanding contributions of India to cataloguing theory. Their helpfulness and importance will be realized fully in due course."

He emphasized that these principles were **ahead of their time**, but remain the most **comprehensive framework** available to guide cataloguing today.

11.6 Examples

1. Cataloguers use the same heading format for all authors (Canon of Consistency).
2. Title page, not cover, is used for verified information (Canon of Ascertainability).
3. Subject heading chosen as per user's likely search (Canon of Sought Heading).
4. Edition and year verified to ensure accuracy (Canon of Currency).
5. Entries updated only when genuinely required (Canon of Permanence).
6. Similar cataloguing rules applied across library networks for uniformity.

12. Canons of Cataloguing

Ranganathan developed **nine canons** (normative rules) that guide cataloguers.

The first eight are discussed below, while the **ninth (Canon of Recall Value)** is detailed in a later module.

12.1 Canon of Ascertainability

The term **Ascertainability** means *that which is traceable or verifiable.*

According to Ranganathan, **information in catalogue entries must be verifiable and not imaginary.**

This canon directs cataloguers to rely on **authentic sources** within the document when preparing entries.

12.2 Main Guideline

"The information provided in the catalogue must be ascertainable — derived from the title page and its associated overflow pages."

This canon applies to:

- Choice and rendering of headings (main and added entries).

- Recording bibliographic details (author, title, edition, publisher, etc.).

12.3 Primary Source of Information

The **title page** is the **chief source** for all cataloguing details, since it is:

- The most authoritative statement of the document's identity.
- Prepared under the author's or publisher's supervision.
- Usually contains the title, author, edition, publisher, and imprint details.

12.4 Exceptions

In certain sections of catalogue entries, data can be taken from **external or derived sources**, such as:

1. **Extract notes or related book notes** (for main or analytical entries).
2. **Leading or directing sections** of cross-reference entries.
3. **Book Index entries** (heading derived from extract or notes).
4. **Class Index entries** (heading and directing sections).

These are justified exceptions because their function is to **guide users** rather than to describe the document itself.

12.5 Additional Sources of Information

Apart from the title page, cataloguers may consult the following parts of a book:

Source	Purpose / Typical Use
Half-title page	Series title or editor's name.
Contents page	For identifying works in a composite book.
Title page of constituent work	For artificial composite or multi-work books.
Preface / Introduction	For clarifying the scope or authorship.
Colophon	For confirming publication details.
Dust jacket or cover	Used only when the title page is missing.

12.6 Significance of the Canon

- Ensures **authenticity** in cataloguing.
- Promotes **accuracy and standardization**.
- Reduces **errors from guesswork** or assumptions.
- Strengthens the **credibility** of the library catalogue.
- Builds **user trust** in catalogue data.
- Provides **clarity of source citation** for each bibliographic element.

12.7 Examples

1. The author's name taken exactly as printed on the title page.
2. A book's title verified from title page, not from cover design.
3. Edition statement copied from the title page verso.
4. Series title identified from half-title page.
5. Publication year confirmed from colophon when not on title page.
6. For an anthology, each story's title taken from its internal title page.

12.8 Summary of Canon of Ascertainability

Key Idea	Description
Definition	Every entry in the catalogue must be based on information that is verifiable from the document.
Purpose	To ensure correctness, authenticity, and reliability of catalogue data.
Primary Source	Title page and its related pages.
Exceptions	Notes, cross-references, and analytical headings may use outside sources.
Effect	Makes cataloguing a factual and scientific activity rather than interpretive.

13. Canon of Prepotence

The **Canon of Prepotence** is one of the foundational canons laid down by Dr. S. R. Ranganathan.

It deals with the **choice of the main entry** — that is, *under which heading a particular document should be entered primarily in the catalogue.*

13.1 Meaning

The word **Prepotence** means *dominance, supremacy, or primary importance.*

Hence, this canon prescribes that:

"Among all the entities connected with a document, the most prepotent (dominant or important) one should be chosen as the main entry heading."

In other words, every document involves several elements — author, title, editor, translator, compiler, etc. But the **cataloguer must identify the one element that represents the document as a whole**, and record it as the *main entry.*

13.2 Purpose

The Canon of Prepotence ensures that:

- Each document has **one single, authoritative main entry**.
- The catalogue maintains **consistency** in the way documents are represented.
- Users can find documents easily, even when multiple contributors are involved.
- Cataloguing avoids duplication and confusion of entries.

13.3 Factors to Determine Prepotence

Entity / Contributor	When It Becomes Prepotent
Author	When the work is original and primarily the author's intellectual creation.
Editor / Compiler	When the book is a collection or compilation by someone other than the original authors.
Translator	When the translation has distinct scholarly value or differs significantly from the original.
Corporate Body	When the work is officially produced by an organization or institution.
Title	When there is no identifiable author (anonymous works).

13.4 Rules Derived from the Canon

1. **One main entry only** — every document must have a single main entry.

2. **Main entry reflects the creator's dominance** — the one most responsible for the document's existence.
3. **Added entries** are made for all other secondary contributors.
4. **Avoid arbitrary choice** — decisions should be guided by evidence on the title page.
5. **Uniform treatment** — apply the same rule to all similar cases across the catalogue.

13.5 Examples

Type of Work	Dominant Element (Main Entry)	Example Entry
Authored book	Author	"Ranganathan, S. R. – Classified Catalogue Code"
Edited book	Editor	"Gupta, K. D. (ed.) – Essays on Information Science"
Translated work	Translator (if distinctive)	"Bhattacharya, G. (tr.) – The Republic by Plato"
Anonymous work	Title	"Encyclopaedia Britannica"
Corporate author	Institution	"UNESCO – World Education Report"
Government publication	Department / Ministry	"India. Ministry of Health – Annual Report"

13.6 Significance

- Ensures **logical consistency** in cataloguing.
- Establishes **a uniform rule for choosing the main entry.**
- Reduces **duplication** and confusion between entries.
- Highlights the **responsible creator or authority** of a work.
- Forms the **basis for author and subject collocation.**
- Strengthens the **retrieval efficiency** of the catalogue.

13.7 Relation to the Laws of Library Science

The Canon of Prepotence aligns closely with:

- **2nd Law** – Every reader his/her book (helps identify the main creator clearly).
- **3rd Law** – Every book its reader (ensures the document is traceable under its main contributor).
- **4th Law** – Save the time of the reader (avoids confusion about where to search).

13.8 Summary

Aspect	Description
Definition	The dominant or most significant entity related to a document should be used as the heading for the main entry.
Purpose	To provide one authoritative access point for each document.
Prepotent Element	Usually the author; otherwise editor, translator, or corporate body.
Result	Consistent, non-duplicative main entries across the catalogue.

13.9 Illustrative Cases

1. *"Principia Mathematica"* → Main entry under **Newton, Isaac.**
2. *"Collected Works of Tagore"* → Main entry under **Tagore, Rabindranath.**
3. *"History of Punjab (ed. by Dr. K. Singh)"* → Main entry under **Singh, K. (ed.)**
4. *"Annual Report, Indian Railways"* → Main entry under **India. Ministry of Railways.**
5. *"Holy Bible"* → Main entry under **Title (Anonymous Work).**
6. *"Constitution of WHO"* → Main entry under **World Health Organization.**

14. Canon of Prepotence

14.1 Meaning

The **Canon of Prepotence** explains how the *arrangement and order of entries* in a catalogue should be determined.

The **potency** (deciding power) that controls where an entry is placed must be **concentrated in its leading section**—especially in the **entry element** (usually the author, title, or class number).

If full concentration in the leading section is not possible, the remaining potency should gradually decrease in intensity as it moves to later parts of the entry.

14.2 Illustration

In earlier times, letters were sorted by **city name**, which was written in **capital letters** or **underlined**.

Later, as postal systems developed, the **PIN code** became the potent (decisive) element.

The same principle applies in cataloguing — the most decisive identifying element should lead the entry.

14.3 Purpose

According to Ranganathan:

"The essence of a catalogue is the *arrangement* of entries. The potency decreases rightwards and downwards from the first letter or digit."

A single error in the **first element** can completely misplace an entry. Hence, this canon ensures:

- Entries are arranged correctly and consistently.
- Each entry begins with the most decisive element.
- Users can find entries easily by predictable sorting.

14.4 Implications

Catalogue Type	Respect for the Canon	Explanation
Main Entry (CCC)	Fully respected	Every work of each author has its unique number — full potency lies in the leading section.
Main Entry (AACR-2R)	Partially violated	Potency sometimes divided between author and title; arrangement not fully controlled by leading section.
Cross Reference Entry	Violates canon	Leading section has little potency; much depends on later sections (locus).
Class Index Entry	Fully respected	Entire potency lies in the leading section (class number is purely supporting).

Book Index / Name & Title Entry	Respected	Both CCC and AACR-2R follow this canon, except AACR-2R sometimes violates it for government publications.

Example:

- CCC: *INDIA, EDUCATION (Ministry of –)* → Potent word "INDIA" leads the entry.
- AACR-2R: *India. Ministry of Education* → Loses some potency because the first word doesn't stand out typographically.

14.5 Significance

- Prevents **loss or misplacement** of entries.
- Ensures **uniform sorting** and **predictable order.**
- Improves **retrieval efficiency.**
- Reflects **discipline and hierarchy** in entry arrangement.

14.6 Examples

1. *SHAKESPEARE, WILLIAM (1564–1616)* – Works → potency lies in surname.
2. *INDIA, AGRICULTURE (Ministry of –)* → first word "India" leads all government works.
3. *RANGANATHAN, S. R.* → potency concentrated in "Ranganathan."
4. *PHYSICS – Textbooks* → potency in "Physics."
5. *UNITED NATIONS – Charter* → potency in organization name.
6. *UNESCO – Education Reports* → potency in corporate heading.

14.7 Summary

Aspect	Description
Definition	Concentrate deciding power of an entry in its leading element.
Purpose	Ensure proper arrangement and ease of retrieval.
CCC Practice	Fully follows the canon.
AACR-2R	Partial violation, especially in government and corporate entries.
Result	Logical order, quick identification, and visual uniformity.

15. Canon of Individualization

15.1 Meaning

The **Canon of Individualization** ensures that **each heading** in the catalogue refers to **one and only one entity.**

Names of persons, institutions, places, series, or subjects must be **uniquely identifiable** by adding distinguishing details.

"The heading should be made to denote one and only one entity by adding the necessary and sufficient number of individualizing elements." – *S. R. Ranganathan*

15.2 Purpose

- Prevent **confusion between identical names (homonyms).**
- Maintain **clarity** and **precision** in catalogue entries.
- Guarantee that every entry leads to **a single, distinct entity.**

If names aren't individualized, the catalogue becomes **ambiguous** and unreliable.

15.3 Implications

Both **CCC** and **AACR-2R** have detailed rules for individualization.

Type of Entity	Rule Reference (CCC)	Individualizing Element
Person	Rule JA5	Year of birth & death added after forename.
Geographical Entity	Rules JB32, JB3, JB41	Add name of country, state, or district.
Temporary Government Organ	Rule JC71	Year of formation added.
Corporate Body / Institution	Rule JD2	Add place, country, or headquarters.
Conference / Meeting	Rule JF2	Add place and year of meeting.
Diplomatic Events	Rules JE3, JE4	Add country or theme of conference.

15.4 Examples

Entity	Non-individualized Form	Individualized Form
Author	"Ranganathan"	"Ranganathan, S. R. (1892–1972)"
City	"Delhi"	"Delhi (India)"
Conference	"Library Conference"	"Library Conference (Delhi, 2019)"
Corporate Body	"Education Department"	"India. Ministry of Education"
University	"Columbia University"	"Columbia University (New York, U.S.)"
Festival	"Film Festival"	"Film Festival (Mumbai, 2022)"

15.5 Significance

- Avoids **homonym confusion.**
- Improves **search accuracy.**
- Provides **precise identification** in multi-author or multi-institution contexts.
- Essential for **authority control** and **database linking.**

17. Canon of Context

17.1 Meaning

The **Canon of Context** prescribes that the **rules of a catalogue code** must be framed and revised according to the **changing environment** in which libraries, books, and bibliographic tools operate.

Cataloguing does not exist in isolation — it must evolve along with **book production, user needs, and bibliographic developments.**

"Rules of a catalogue code should be formulated in the context of the mode of book production, nature of library organization, and existence of published bibliographies — and must be revised with time." – *S. R. Ranganathan*

17.2 Main Elements

Context Area	Explanation
1. Book Production	Reflect current features of books (digital media, new formats).
2. Library Organization	Reflect the type of service (open access, digital systems, etc.).
3. Bibliographies and Tools	Adjust rules to use existing bibliographic aids effectively.
4. Revision Over Time	Catalogue codes must evolve as contexts change.

17.3 Implications

- In open access systems, omit unnecessary bibliographic details (e.g., size, pages, annotation).

- Avoid duplication of analytical entries if good bibliographies already exist.
- Adjust cataloguing for **digital and electronic resources.**
- The **Canon of Recall Value** (later developed) stems from this canon, focusing on words of highest recall.
- Periodic **revision of codes** (e.g., AACR → AACR2 → RDA) fulfills this canon.

17.4 Examples

1. Dropping page counts in modern open-access catalogues.
2. Adding metadata fields for e-books or digital media.
3. Omitting annotation if bibliographic abstracts are available online.
4. Using standard identifiers (ISBN, DOI) as new cataloguing elements.
5. Adopting RDA to align with international practices.
6. Revising subject headings to include interdisciplinary terms.

17.5 Summary

Aspect	Description
Definition	Catalogue rules must reflect the current context of library practice and publication.
Purpose	Keep cataloguing relevant, efficient, and aligned with real-world developments.
Effect	Promotes adaptability and modernization of catalogue codes.

18. Canon of Permanence

18.1 Meaning

The **Canon of Permanence** ensures **stability** in catalogue headings and entries.

It states that once a heading or element is established, it **should not be changed**, unless the catalogue code itself is revised in response to the **Canon of Context.**

"No element in an entry should be changed except when the rules themselves are revised." – *Ranganathan*

18.2 Purpose

To achieve **consistency and stability** in catalogue records over time.

- Frequent changes create confusion, errors, and waste of effort.
- Stability allows users to develop familiarity with catalogue structure.
- Supports long-term data integrity and authority control.

18.3 Implications

- Once chosen, a **heading or form of name** remains fixed.
- Cross-references handle alternate or new forms (avoiding duplication).
- Prevents unnecessary re-cataloguing.
- Balances with Canon of Context — permanence holds unless revision is justified.

18.4 Example Case

An author uses two pseudonyms:

Case	Approach
Book 1	Written as "John Doe" → catalogue under *John Doe*.
Book 2	Written as "Richard Roe" → separate heading created.
Later discovery	Real identity same → keep both headings; link through **Cross Reference**.

Changing earlier entries would violate **Canon of Ascertainability** and **Law of Parsimony**.

18.5 Examples

1. Keeping author headings constant even if spelling varies later.
2. Retaining "Bombay" in earlier entries though now "Mumbai."
3. Maintaining old corporate headings (e.g., "ICAR") until official change.
4. Using cross-reference for pseudonyms rather than renaming.
5. Preserving old title form for consistency in historical collections.
6. Revising only after full rule revision, e.g., when adopting RDA.

18.6 Summary

Aspect	Description
Definition	Catalogue headings must remain stable unless rule revision demands change.
Purpose	Ensure stability, save labour, and maintain uniformity.
Exception	Change allowed only per Canon of Context.
Result	Consistent, trustworthy catalogue records.

19. Canon of Currency

19.1 Meaning

This canon applies to **subject headings** and **class index entries.**

It requires that the **terms used** in catalogues should reflect **current usage** among readers and subject experts.

"The term used to denote a subject in catalogue entries should be the one in current usage." – *Ranganathan*

19.2 Purpose

To serve readers under the **most familiar and contemporary term**, rather than obsolete or outdated terminology.

It directly supports the **Second Law of Library Science — Every reader his/her book.**

19.3 Implications

- Cataloguers must stay updated with changing terminology.
- Subject headings and descriptors should evolve with language and knowledge.
- However, this may conflict with the **Canon of Permanence** (stability).
- Resolution:
    - **Canon of Currency** applies to **subject headings**,
    - **Canon of Permanence** applies to **name headings.**

19.4 Challenges

Issue	Explanation
Changing terms	e.g., *Library Economy → Library Science*.
Field specialization	Specialists may use different terms than general readers.
Dual currency	Both old and new terms may coexist for a time.

Hence, cataloguers should **prefer the term best known to most readers**, often the **multiworded general term**.

19.5 Examples

Old Term	Current Term	Reason
Library Economy	Library Science	Current professional usage.
Politics	Political Science	Academic evolution.
Natural Philosophy	Physics	Modern scientific term.
Political Economy	Economics	Widely accepted terminology.
Materia Medica	Pharmacology	Modern usage.
Pedriatrics	Child Medicine	Reader-friendly general term.

19.6 Summary

Aspect	Description
Definition	Subject terms in catalogues should reflect current usage.
Purpose	Make subject access familiar and intuitive to users.
Conflict	May oppose Canon of Permanence; resolved by scope partition.
Preference	Use general, multiworded terms familiar to majority users.

20. Canon of Consistence

20.1 Meaning

The **Canon of Consistence** demands **uniformity and harmony** among all catalogue entries.

It applies both **within** a single entry (between main and added entries) and **across** all entries in a catalogue.

"Rules of a catalogue code should provide for all added entries to be consistent with their main entry, and all entries consistent with one another in essentials like choice, rendering, and style." – *CCC Definition*

20.2 Purpose

- Ensure **uniform presentation** and **style.**
- Help users develop **familiarity** with catalogue format.
- Save reader's and staff's time through **predictable patterns.**

20.3 Implications

Area	Requirement
Main vs Added Entries	Must be consistent in heading style, punctuation, and structure.
Across Documents	Same rules applied to all similar cases (e.g., author order, capitalization).
Style	Consistent abbreviations, punctuation, and spacing.
Rendering	Same treatment for names, titles, and series entries.

Inconsistency anywhere weakens the catalogue's reliability and usability.

20.4 Examples

1. All main entries use "Surname, Forename" format.
2. Added entries follow the same punctuation style as main entries.

3. Same capitalization rules applied across catalogue (e.g., title case).
4. Government departments catalogued uniformly (e.g., “India. Ministry of Health”).
5. Series titles recorded consistently (“Cambridge Studies in Linguistics”).
6. Similar subject headings follow identical word order.

20.5 Significance

- Builds **reader confidence** in catalogue accuracy.
- Enables **inter-library standardization.**
- Simplifies **training and automation.**
- Reduces confusion for both users and cataloguers.

21. Canon of Recall Value

21.1 What is Recall Value?

Recall value = the relative potency of a word or word-group (within a multiword name) to be *recalled by the majority of readers*.

When an entity (person, government, institution, conference, etc.) has a multiword name, the catalogue entry element should be the word/word-group with the **highest recall value** — the term most readers will remember and use when searching.

21.2 Definition (canon)

In a multiword name of a person, government, near-sovereign body, quasi-government, institution, conference, organ of government/institutions/conference, or in a multiword title (non-periodical), **the entry element shall be the word or word-group of highest recall value**.

21.3 Why it is needed (brief)

1. Explosion of **corporate authorship** and institutions worldwide.
2. Growing **variety** of corporate body forms (near-sovereign bodies, task forces, projects).
3. **Near-homonymous** names (many institutions with similar names).
4. Increase in **multiworded names** — majority now have >3 words.
5. Multiple **alternative names / abbreviations / local names** in use.
6. **Human memory limits** — users rarely recall exact full sequence of words.

These factors make it impractical to expect users to type the exact title; catalogue must use the most memorable element.

21.4 Application rules

Entity type	Entry element (high recall)	Secondary element
Whole Government	Territory / country name (e.g., INDIA)	rest (if needed)
Near-sovereign body	Name/subject of body (e.g., UNITED NATIONS)	remainder (with dash)
Quasi-government	Territory or jurisdictional name (e.g., MYSORE (District))	—
Institution	Subject/organ or generic term (e.g., LIBRARY (National —))	remaining words
Conference	Subject or class of participants (e.g., SPECTROSCOPY (International —))	place/year as secondary

Title heading	Word/phrase indicating scope (e.g., SOCIAL SCIENCES (Encyclopaedia of —))	rest as secondary

(Use dash "(—)" to indicate the blank where the entry element stands; render highest-recall words in capitals as per CCC practice.)

21.5 Practical guidelines / notes

- Render the **highest recall word/group in the entry element**; put the remainder as secondary (often indicated with parentheses and a dash).
- For governments and territorial bodies, prefer **name of territory** rather than bureaucratic words.
- For institutions, prefer the **subject or functional word** (Library, Laboratory, Council) when that is the likely recall word, otherwise a unique/fanciful word if that is what users recall.
- For conferences, prefer the **subject** or **class of persons** (e.g., "Peace (Conference) (Paris) (1919)").
- For titles used as headings (encyclopedias, general biographical works), entry element is the **earliest/highest-recall word/group** (first two words often capitalized).

21.6 Examples (six clear cases)

1. **Government**: Entry element → INDIA
   Catalogue entry: INDIA. Ministry of Health (search by country succeeds)
2. **Near-sovereign body**: Entry element → UNITED NATIONS
   Catalogue entry: UNITED NATIONS (– Organization) or UNITED NATIONS as main heading
3. **Quasi-government / district**: Entry element → MYSORE (District)
   Catalogue entry: MYSORE (District) Board — user recalls 'Mysore'
4. **Institution**: Entry element → LIBRARY (National –)
   Catalogue entry: LIBRARY (National —) (India) rendered as LIBRARY (National –) India so users seeking "National Library" find it
5. **Conference**: Entry element → SPECTROSCOPY (International – Colloquium)
   Catalogue entry: SPECTROSCOPY (International –) with place/year as secondary (Prague, 1978)
6. **Title as heading (encyclopaedia example)**: Entry element → SOCIAL SCIENCES (Encyclopaedia of –)
   Catalogue entry: SOCIAL SCIENCES (Encyclopaedia of –) so users looking for subject encyclopedias find it readily

22. Relation between Canon of Recall Value and Other Canons

22.1 Canon of Ascertainability

Relation:

Recall value depends on **ascertainable information** — that is, the word or phrase must be taken from what actually appears on the **title page or overflow pages** of the document, not from imagination.

Explanation:

The **Canon of Ascertainability** ensures that cataloguers use only verifiable data. The **Canon of Recall**

Value then identifies, among those verified words, the one with the *highest recall strength* — the word most users would remember.

Example:

Title: *Association of Special Libraries and Information Centres*

- Ascertainability: Take words exactly as printed.
- Recall Value: Select **LIBRARIES** as entry element → LIBRARY (Association of Special — ies) because "libraries" is what most users will recall first.

Key Point:

Recall value *operates within the boundary* defined by Ascertainability.

Publishing practice itself can help — printers could highlight or embolden the key recall word (e.g., "Libraries").

22.2 Canon of Prepotence

Relation:

Both canons involve **potency**, but they operate at different levels.

Canon	Concern	Scope
Prepotence	Placement and arrangement of entries in the catalogue.	Controls **position** and **sorting order.**
Recall Value	Choice of the most memorable entry element within a multiword heading.	Controls **selection** of entry element.

Example:

Title: *Association of Public Libraries*

- **By Prepotence:** PUBLIC LIBRARIES (Association of —)
  → Potent word is first for alphabetical order.
- **By Recall Value:** LIBRARY (Association of Public — ies)
  → "Library" has higher recall among users.

Difference:

Prepotence manages **mechanical arrangement**,

Recall Value manages **psychological recall.**

Connection:

Both ensure that the entry element holds *maximum identifying power*, though Prepotence looks at order, while Recall Value looks at user memory.

22.3 Canon of Individualization

Relation:

Individualization eliminates **confusion between identical names** (homonyms).

Recall Value ensures the chosen **entry word** is the one most likely remembered by users.

Scope Comparison:

Canon	Focus	Applies to
Individualization	Distinguishing entities with same/similar names.	Persons, places, corporate bodies (single or multiword).
Recall Value	Choosing most memorable word in multiword names.	Mainly multiworded corporate bodies or personal names.

Example:

- Two institutions:
    1. *All India Board of Adult Education*
    2. *National Council of Adult Education*

    → "Adult Education" = word of highest recall (Recall Value).

    → "All India Board" vs. "National Council" = individualizing elements (Individualization).

Connection:

Recall Value picks *which term leads*;

Individualization adds *what distinguishes* it from others.

22.4 Canon of Context

Relation:

The **Canon of Context** led to the birth of the **Canon of Recall Value.**

Changes in society, publishing, and library organization created new naming patterns (e.g., long, complex institutional names), requiring a rule to handle them.

Explanation:

- With thousands of new institutions and near-sovereign bodies, recall became harder.
- The Canon of Context demanded cataloguing principles evolve accordingly.
- The Canon of Recall Value is a *response* to this contextual change.

Example:

Modern institutions such as *International Centre for Theoretical Physics* or *National Institute of Advanced Studies* need recall-based headings (e.g., "INSTITUTE (National — of Advanced Studies)").

Connection:

Context produced the **need**; Recall Value provided the **solution.**

22.5 Canon of Sought Heading

Relation:

Both canons are **reader-centered** and concerned with how users approach the catalogue.

Comparison:

Canon	Focus	Goal
Sought Heading	Determines *which headings* to provide, based on reader approaches.	Ensure every likely reader search is served.
Recall Value	Determines *which word in heading* to use, based on memory potency.	Help readers recall and locate entries quickly.

Shared Principles:

- Both are grounded in **user psychology**.
- Both depend on **cataloguer's judgement, experience, and observation of user behavior.**
- Both aim to make the catalogue more **intuitive and efficient.**

Example:

- A reader remembers "UNESCO" (not "United Nations Educational, Scientific and Cultural Organization").

  → Sought Heading ensures a reference exists for UNESCO.

  → Recall Value ensures "UNESCO" is used as main entry element because it has the highest recall.

Connection:

Sought Heading decides *what entries to include*.

Recall Value decides *how to render those entries.*

22.6 Summary

Related Canon	Nature of Relation with Recall Value	Key Distinction
Ascertainability	Recall must use only verifiable words from title page.	Ensures recall term is authentic.
Prepotence	Both involve potency but Prepotence = order; Recall = memory.	Prepotence arranges; Recall selects.
Individualization	Both refine heading formation.	Individualization distinguishes; Recall prioritizes recall term.
Context	Contextual changes produced the Recall canon.	Recall is a contextual response to complex names.
Sought Heading	Both are reader-oriented.	Sought Heading = which headings; Recall = which term leads.

22.7 Examples (six combined illustrations)

1. *Association of Special Libraries and Information Centres*

   → LIBRARY (Association of Special – ies) (Ascertainability + Recall Value)
2. *Association of Public Libraries*

   → LIBRARY (Association of Public – ies) (Prepotence vs Recall Value contrast)
3. *All India Board of Adult Education*

   → ADULT EDUCATION (All India Board of –) (Individualization + Recall)
4. *National Council of Adult Education*

   → ADULT EDUCATION (National Council of –) (Individualization applied again)
5. *UNITED NATIONS (– Organization)*

   → Reflects Canon of Context — result of new organizational forms.
6. *UNESCO*

   → Recall Value aligns with Sought Heading: short, memorable, directly recalled by readers.

22.8 Essence

- The **Canon of Recall Value** acts as a *bridge* between mechanical arrangement (Prepotence) and psychological approach (Sought Heading).
- It functions *within ascertainable facts*, *refines individualized names*, and *arises from contextual evolution.*
- Together, these canons create catalogues that are **accurate, stable, and user-oriented**, yet sensitive to how real people search and remember.

23. General Laws of Cataloguing

General Laws are broad principles that govern **all branches of Library Science**, including **cataloguing**. They ensure consistency, fairness, clarity, and economy in cataloguing practices.

Ranganathan identified the following **four General Laws of Cataloguing**:

1. **Law of Interpretation**
2. **Law of Impartiality**
3. **Law of Symmetry**
4. **Law of Parsimony**

23.1 Law of Interpretation

Definition:

According to *CCC*,

"The well-known principles of interpretation, such as the 1,008 principles of interpretation listed in the *Nyaya-Kosa*."

This law treats a **catalogue code as a legal document**, requiring careful interpretation when applying or resolving its rules.

Implications:

- In cases where **two canons or rules conflict**, the cataloguer must interpret the code logically rather than mechanically.
- When a **new type of document** appears (for example, an e-book or a dataset) that existing rules don't cover, the cataloguer may extend or modify the rule through rational interpretation.
- The law ensures **flexibility and adaptability** without breaking the structure of the code.

Examples:

1. When a book lacks a clear author, interpret the rule to use the **title** as heading.
2. For emerging formats (like multimedia kits), interpret older "book-based" rules suitably.
3. If two rules contradict, e.g., Canon of Context vs. Canon of Permanence, interpret in favor of the reader's access.
4. Interpret how to enter **corporate digital documents** even if CCC didn't mention them.
5. When a code omits specific instruction, derive meaning through analogical reasoning.
6. Amend or annotate the rule later after consistent interpretation is accepted.

Summary:

Aspect	Description
Purpose	To guide cataloguers in resolving rule conflicts through reasoned interpretation.
Effect	Ensures logical consistency, flexibility, and completeness in cataloguing.
Analogy	Catalogue code ≈ legal document requiring judicial interpretation.

23.2 Law of Impartiality

Definition:

"Between two or more claimants—say, for use as heading—the preference of any one should be made only on sufficient grounds, and not arbitrarily."

Implications:

- All possible claimants for a heading must be treated **fairly and equally**.
- Decision must rest on **logical grounds**, not bias or convenience.
- Promotes fairness when dealing with **joint authors, alternative titles, or multiple series.**

Examples:

1. Book by two authors → both get equal right for heading or added entries.
2. Book with an **alternative title** → prepare an entry under both titles.
3. Document part of multiple **series** → provide entries for each series.
4. Cataloguing co-editors → both treated equally, unless hierarchy is clear.
5. Works with bilingual titles → prepare entries in both languages.
6. Equal treatment for translations and originals when both are held by library.

Summary:

Aspect	Description
Purpose	Avoid favoritism or bias in assigning headings or entries.
Effect	Ensures equitable and transparent cataloguing practice.
Outcome	Balanced representation of all contributors and titles.

23.3 Law of Symmetry

Definition:

"If two entities or situations which admit of being regarded as symmetrical counterparts of each other—if one is given weight in any particular context, the other should also be given corresponding weight."

Implications:

- Treat **symmetrical cases** equally.
- Maintains **balance and consistency** in cataloguing forms.
- Especially relevant for **joint authors, editors, translators, or collaborators.**

Examples:

1. Two joint authors → prepare two book index entries:
    - Entry 1: Author A and Author B
    - Entry 2: Author B and Author A
2. Books with dual editors → both editors listed in turn.
3. Two translated versions of same work → each given equal reference.

4. Works in parallel languages → provide symmetrical entries for each.
5. Multi-part works with equal contributors → reciprocal references.
6. Both main and added entries receive equal treatment in formatting.

Summary:

Aspect	Description
Purpose	To maintain balance in treatment of symmetrical situations.
Effect	Prevents one entity from being overemphasized at the expense of another.
Result	Logical, harmonious catalogue structure.

23.4 Law of Parsimony

Definition:

"Between two or more possible alternative rules bearing on a particular phenomenon, the one leading to overall economy of manpower, material, money, and time considered together with proper weightage, is to be preferred."

Implications:

- This law ensures **economy and efficiency** — use the least costly and most time-saving method without sacrificing quality.
- Functions as the **"finance secretary"** of library science.
- Encourages simplification, brevity, and elimination of redundant effort.
- Sometimes conflicts with user-centered laws (e.g., Sought Heading), requiring **compromise solutions**.

Applications and Examples:

Example	Explanation
1. Omit physical details in open access systems	Readers can inspect books themselves; no need to record size or pagination.
2. Reduce duplication	Same book need not have separate entries for trivial variants.
3. Cross Reference Index Entries (CRIE)	A compromise between Canon of Sought Heading (serve every reader) and Law of Parsimony (avoid excess entries).
4. Simplified chain procedure	Only relevant headings used; unnecessary "unsought" links removed.
5. Use of unit cards	Standardized card forms reduce effort and printing cost.
6. Adopt machine-readable cataloguing (MARC)	Saves staff time and avoids repetition in data entry.

Summary:

Aspect	Description
Purpose	Promote economy in cataloguing practices.
Effect	Saves time, labour, and cost while retaining usefulness.
Balance	Sometimes compromises with other user-oriented laws.
Outcome	Efficient, practical, and sustainable catalogue systems.

23.5 Overall View

Law	Core Idea	Function in Cataloguing
Interpretation	Apply rules like legal principles.	Resolve conflicts logically and flexibly.
Impartiality	Treat all claimants equally.	Avoid bias between authors, titles, or series.
Symmetry	Give equal weight to symmetrical cases.	Maintain consistency among joint contributors.
Parsimony	Choose the most economical rule.	Save time, money, and labour in cataloguing.

24. Principles of Cataloguing

The *Classified Catalogue Code (CCC)* recognizes **four major principles** that guide the formulation, interpretation, and practical application of cataloguing rules.

These principles ensure that cataloguing remains **flexible, evolving, unified, and probabilistically sound.**

The four principles are:

1. **Principle of Local Variation**
2. **Principle of Osmosis**
3. **Principle of Unity of Idea**
4. **Principle of Probability**

24.1 Principle of Local Variation

Definition:

No international catalogue code can function effectively without provision for **local or linguistic variations**. Each region or language requires specific rules for its publishing practices, naming conventions, and writing systems.

Implications:

- International codes (like AACR or ISBD) should specify **what is left to national adaptation**, and national codes should, in turn, specify what is handled locally.
- Local variations address **language-specific, cultural, or publication-related differences**.
- Ensures cataloguing standards are **globally consistent yet locally adaptable**.

Applications:

Area	Local Variation Example
Transliteration	Different rules for rendering non-Roman scripts (e.g., Hindi, Arabic).
Rendering of personal names	Handling of single-word surnames like *Saxena*, *Jain*, *Dasgupta*.
Cataloguing short-lived materials	Bank Nationalization Acts or temporary agreements (e.g., Simla Pact) may need simpler treatment.
Level of detail	Old incunabula may need detailed cataloguing; pamphlets may need only a shelf list.
Typography differences	Use of capitals, italics, etc., differs between English and Hindi catalogues.

Essence:

Uniformity at the cost of practicality leads to confusion; cataloguing must reflect **local linguistic and bibliographic realities**.

24.2 Principle of Osmosis

Meaning: "Living with the present."

A principle that allows catalogues to **adapt gradually** to necessary changes—without disrupting library operations or exhausting resources.

Ranganathan's View:

When a new code or classification becomes necessary (as guided by the *Canon of Context*), one must adopt it **through gradual absorption**, not immediate overhaul.

Two extreme options (and their problems):

1. **Immediate re-cataloguing** of the entire collection → impractical and costly (violates Law of Parsimony).
2. **Ignoring the change** → results in outdated, inconsistent catalogues (violates Canon of Context).

The Compromise = Principle of Osmosis.

Steps of Implementation:

Step	Description
1	Catalogue and classify **new accessions** using the new code.
2	Re-catalogue **frequently used older books** first.
3	Keep **new and old collections separate** physically and in card arrangement.
4	Invite **readers' attention** to both collections.
5	When old books are borrowed and returned, **re-catalogue** them before reshelving.

Essence:

Cataloguing reforms should spread **naturally and continuously**, like osmosis — quietly integrating new standards over time.

24.3 Principle of Unity of Idea

Definition:

"No rule in a catalogue code should deal with more than one idea or element at a time."

This ensures that every rule in a code has a **single, clear focus** — improving precision, readability, and usability.

Elements of a Catalogue Code (each should be governed separately):

1. Definition of cataloguing terms
2. Interpretation of those terms in context
3. Choice of information for each section of an entry
4. Rendering (form of expression)
5. Style of recording

Implications:

- Avoid complex rules that mix multiple concepts (e.g., authorship, form, and style in one rule).
- Improves **clarity, training, and application** for cataloguers.
- Makes future **revisions** simpler and logical.

- Prevents contradictions and confusion between related rules.

Examples:

1. One rule defines **authorship**, another separately defines **editorial responsibility** — not both in one rule.
2. The rule for **choice of main entry** should not also describe **how to render the title**.
3. Definition and style of "series title" handled independently.
4. Style of capitalization or punctuation defined apart from choice of heading.
5. Interpretation of cataloguing term (like "chief source of information") treated separately from its application.
6. Each concept gets one rule; unity in idea ensures unity in practice.

Essence:

Rules should be **atomic and independent**, each dealing with one clear concept — promoting logical unity throughout the code.

24.4 Principle of Probability

Definition:

"Making the word belonging to the more numerous group of entry increases the probability for satisfying the Canon of Prepotence."

In simple terms, when selecting an **entry element**, prefer the one that is **most likely remembered or used** by the majority — statistically the most probable.

xplanation:

- This principle bridges **statistics and user psychology**.
- It complements the **Canon of Prepotence** by ensuring that the word chosen for the entry has the **highest likelihood** of being sought.
- It's essentially a **probabilistic justification** for practical cataloguing choices.

Examples:

1. Among variants of institutional names, choose the one **most frequently cited** (e.g., "World Bank" instead of "International Bank for Reconstruction and Development").
2. In choosing between "Political Science" and "Politics," select "Political Science" if it appears more often in the literature.
3. For cataloguing "University of California, Los Angeles," choose "UCLA" as secondary heading if it's more commonly recognized.
4. When two transliterations exist, choose the one **more widely used**.
5. For personal names with alternate forms (e.g., "Mahatma Gandhi" vs. "Mohandas K. Gandhi"), choose the form **more often recalled** by users.
6. Among subject synonyms, use the one **frequently occurring in bibliographies or indexing sources.**

Essence:

The Principle of Probability ensures cataloguing choices are grounded in **common usage and empirical likelihood**, not in theoretical purity.

24.5 Summary Table

Principle	Focus	Function	Key Outcome
Local Variation	Adaptation to regional and linguistic needs.	Allows customization within international standards.	Flexibility with local accuracy.
Osmosis	Gradual adaptation to change.	Enables smooth transition from old to new systems.	Evolution without disruption.
Unity of Idea	One concept per rule.	Prevents confusion and overlaps in catalogue code.	Logical clarity and simplicity.
Probability	Use of most likely recallable term.	Ensures choice satisfies Prepotence and user recall.	Practical and user-centered cataloguing.

24.6 Core Insight

Together, these four principles make cataloguing:

- **Local in form**,
- **Dynamic in growth**,
- **Unified in thought**, and
- **Empirical in approach.**

They transform cataloguing from a static record-keeping activity into a **living, adaptive, and user-oriented discipline.**

25. Forms of Library Catalogue

The form of a library catalogue can be studied under two main aspects:

1. **Outer or Physical Forms** — related to the *external structure, appearance, and arrangement* of catalogue entries.
2. **Inner or Kind Forms** — related to *the contents and arrangement of information* (to be covered later).

25.1 Physical Form of Library Catalogue

The **physical form** refers to the *shape, size, and outward structure* of the catalogue — how it appears to the reader and how entries are organized or accessed physically.

25.1.1 Types of Physical Forms

Physical forms are divided into two categories:

1. **Conventional Forms**
2. **Non-Conventional Forms** (modern or electronic, discussed later)

We begin with **Conventional Forms**, which were historically dominant before computerization.

25.2 Conventional Forms

Conventional forms include:

a) **Printed / Register / Book Form**

b) **Card Catalogue**

c) **Sheaf Catalogue**

25.2.1 Printed, Register, or Book Form

A **Book Catalogue** is one in which catalogue entries are **handwritten or printed and bound** into one or more volumes.

It was the **oldest and most traditional** form of library catalogue.

Historical Note:

- The first printed library catalogue was the **Harvard Catalogue (1723)**.
- Later examples include the **Yale Catalogue (1745)**, the **British Museum Catalogue**, and the **National Library, Calcutta Catalogue**.

25.2.1.1 Advantages

1. **Portable** – Can be carried and consulted anywhere, even outside the library (for smaller catalogues).
2. **Easy to handle** – Compact and quick to consult.
3. **Multiple entries visible** – Several entries can be viewed at once on an open page.
4. **Useful reference source** – Large printed catalogues serve as book-selection tools for other libraries.
5. **Space-saving** – Occupies less physical space than card cabinets.
6. **Multiple copies possible** – Several readers can use it simultaneously if copies are printed.

25.2.1.2 Disadvantages

1. **Expensive and time-consuming** to compile and print.
2. **Quickly becomes outdated** – No facility to insert new entries.
3. **Less durable** – Frequent handling leads to wear and tear.
4. **No cooperative cataloguing** possible, as shared data services use cards or digital forms.
5. **No guiding or indexing facility** – Difficult to navigate large catalogues.

Result:

Though once dominant, the printed catalogue was **replaced by the Card Catalogue** due to its lack of flexibility.

25.2.2 Card Catalogue

A **Card Catalogue** consists of entries written or typed on **uniform-sized cards** (usually 12.5 × 7.5 cm), filed alphabetically or by another scheme in drawers of a wooden or metal cabinet.

A **steel rod** passes through each tray to secure the cards.

Historical Background:

- The earliest known use of cards was by **Rosier**, who prepared the *Catalogue of the Paris Academy of Sciences*.
- It became widespread in the 19th century; **Trinity College, Dublin** was among the first in the UK to adopt it.

25.2.2.1 Advantages

1. **Always up to date** – Cards can be added or removed anytime.
2. **Guiding facility** – Tabs or guides help quick navigation.
3. **Easy to handle** – Individual cards are light and manageable.
4. **Durable** – Cards last longer than bound pages.
5. **Flexible arrangement** – Entries can be reorganized in any order.
6. **Supports cooperative cataloguing** – Shared or standardized card formats make collaboration possible.
7. **Economical to maintain** – Only changed or new cards need replacement.
8. **Neat and professional appearance.**

25.2.2.2 Disadvantages

1. **Occupies large space** – Cabinets and drawers are bulky.
2. **Limited access** – Only one person can use one drawer at a time.
3. **Not portable** – Must be used where the cabinet is located.
4. **Expensive equipment** – Cards, drawers, and cabinets are costly.
5. **Vulnerability to tampering** – Cards can be misplaced or removed by careless or mischievous readers, despite the locking rod.

25.2.3 Sheaf Catalogue

The **Sheaf Catalogue** is made up of **slips or sheets fastened in a binder**, allowing insertion or removal of individual pages or slips.

Each slip (usually 6″ × 4″) is notched at the left side for binding.

Historical Development:

- First used at the **University Library of Leyden (Holland)** in 1876.
- Improved by **Madam Ricci (1891)** and **J.D. Brown (1892)**, who introduced the *Adjustable Sheaf Catalogue.*
- The modern form, with a shelf-locking wicket, was designed by **Arthur Lambert**.
- Commonly used in **public libraries of the U.K.**

25.2.3.1 Advantages

1. Combines **benefits of book and card catalogues** — allows insertion and withdrawal of entries.
2. Multiple entries can be recorded on one slip.
3. **Economical** – Slips are cheaper to prepare and replace.
4. **Space-saving** – Occupies less room than a full card cabinet.
5. **Portable and manageable** – Easier to handle than drawers or large books.

25.2.3.2 Disadvantages

1. If one book per slip → **wastage of stationery**; if many → overcrowded, needing retyping.
2. **Carbon copies** (duplicates) often unclear or unattractive.
3. **Less durable** – Slips wear faster than cards.

4. **Insertion/removal not smooth** – More cumbersome than card trays.
5. **Cooperative cataloguing not feasible.**
6. **Guiding inadequate.**
7. **Non-portable** – Usually kept fixed in the library for consultation only.

25.2.4 Comparative View of Conventional Forms

Feature	Book Catalogue	Card Catalogue	Sheaf Catalogue
Updating facility	None	Easy	Moderate
Durability	Moderate	High	Low
Space requirement	Minimum	Maximum	Moderate
Portability	High (for small sets)	None	Limited
Ease of use	Simple	Good	Average
Cooperative cataloguing	Not possible	Possible	Not possible
Cost	High to print	Moderate	Low
Guiding facility	None	Excellent	Poor
Suitability	Small/closed libraries	Large/open access libraries	Medium/small libraries (temporary use)

25.3 Summary

The evolution of physical forms of catalogues reflects a constant tension between **portability, durability, and flexibility**:

- **Book form** offered convenience but no adaptability.
- **Card form** brought flexibility and collaboration but required more space and cost.
- **Sheaf form** tried to bridge both but achieved limited success.

Each form represents a **stage in the technological and managerial development** of cataloguing, leading eventually to **non-conventional and digital forms** such as **microform, computer-based, and OPAC catalogues**, which combine the strengths of all earlier systems.

26. Non-Conventional (Modern) Forms of Library Catalogue

With the rapid advancement of **computer and communication technology**, libraries have shifted from traditional catalogue formats to **non-conventional or modern forms**.

These modern catalogues overcome the physical and logistical limitations of book, card, and sheaf catalogues.

The major **non-conventional forms** are:

1. **Visible Index Catalogue**
2. **Microform Catalogue**
3. **Machine-Readable Catalogue**

26.1 Visible Index Catalogue

Definition:

A *Visible Index Catalogue* consists of **cards or strips mounted flat in frames or drawers**, with only their top edges visible.

Each card's **heading** is displayed at the edge, making it possible to scan entries quickly without removing the cards.

Structure:

- Cards are usually of size **12.6 × 20 cm.**
- Each card is placed inside a **kraft pocket**, leaving its heading visible.
- The pockets are stored in **steel cabinets**, and when a tray is pulled out, only the headings show.

Example of Use:

This form has been used in some **Indian libraries** for maintaining **current periodicals or record listings** (e.g., gramophone records, illustrations).

26.1.1 Advantages

1. **Quick scanning** – Headings are visible without handling the full card.
2. **Compact display** – A large number of entries can be viewed at once.
3. **Useful for specialized purposes** – Ideal for limited or frequently changing data like current journals.

26.1.2 Disadvantages

1. **Bulky** – Occupies **more space** than even a book catalogue.
2. **Not portable** – Must be consulted within the library.
3. **No duplication** – Multiple copies cannot be easily made.
4. **Limited functionality** – Not suitable for general library cataloguing.
5. **Difficult to maintain** – Replacing or adding entries is inconvenient.

Conclusion:

The Visible Index form never gained wide acceptance as a full catalogue system.

It remains suitable **only for quick reference lists** — such as **periodical holdings, photographs, or audio-visual materials.**

26.2 Microform Catalogue

Definition:

A *Microform Catalogue* is a catalogue where entries are **reduced photographically** and printed onto **microfilm** or **microfiche**.

Microfilm requires a **reader or viewer** to magnify the image for use.

Types:

- **Microfilm** – A continuous roll of film containing miniature images of catalogue entries.
- **Microfiche** – Flat sheets (typically 4 × 6 inches) containing micro-images in a grid pattern.

26.2.1 Advantages

1. **Compact and space-saving** – Occupies a fraction of the space of card catalogues.
2. **Portable** – Easy to store and transport.
3. **Durable and stable** – Resistant to dust, insects, and frequent handling.
4. **Multiple copies possible** – Can be duplicated economically.
5. **Low maintenance** – Requires little physical upkeep once created.

6. **Good for archiving** – Preserves large catalogues in small storage formats.

26.2.2 Disadvantages

1. **Requires special equipment** – Cannot be read with the naked eye; needs a **microfilm reader**.
2. **Expensive readers** – Cost of equipment may be high for small libraries.
3. **Not user-friendly** – Searching is slower compared to electronic catalogues.
4. **Updates difficult** – Adding or deleting entries involves re-filming portions of the catalogue.
5. **Limited interactivity** – Difficult to cross-reference or rearrange entries.

Conclusion:

Microform catalogues are ideal for **archival purposes** and **space-saving storage**, but not for **daily interactive searching**.

They represent an **intermediate stage** between physical and digital catalogues.

26.3 Machine-Readable Catalogue

Definition:

A *Machine-Readable Catalogue (MARC)* is a **computerized catalogue** where bibliographic data is stored on **magnetic tapes, disks, or digital servers**, and accessed either **offline** or **online**.

Two Modes:

1. **Offline Catalogue:**
    - Entries stored on a computer but accessed only at set times or through printed outputs.
    - Early examples include catalogues on **magnetic tape**.
2. **Online Catalogue (OPAC – Online Public Access Catalogue):**
    - Data stored in real-time digital systems.
    - Searchable directly by users through terminals or computers at any time.

26.3.1 Advantages

1. **Always up to date** – Entries can be edited or added instantly.
2. **Fast retrieval** – Quick and accurate search through multiple access points (author, title, subject, keyword).
3. **Multiple users** – Several people can use the catalogue simultaneously.
4. **Space-saving** – Requires no physical trays, drawers, or paper storage.
5. **Inter-library connectivity** – Can link with union catalogues or online databases.
6. **Efficient output** – Bibliographies and reports can be generated automatically.
7. **Saves time and labour** – Once data is entered, it can be reused endlessly.

26.3.2 Disadvantages

1. **High initial cost** – Hardware, software, and training required.
2. **Dependence on power and technology** – Access limited during technical failures.
3. **Maintenance cost** – Requires regular updating and IT support.
4. **Digital literacy needed** – Users and staff must be trained to search effectively.

Conclusion:

The **Machine-Readable Catalogue (MARC)** is now the **standard format** in libraries worldwide.

It is the foundation of **OPACs, Web-based catalogues, and library automation systems** — combining all the advantages of earlier physical and microform catalogues.

26.4 Comparative Overview

Feature	Visible Index	Microform Catalogue	Machine-Readable Catalogue
Medium	Printed strips or hinged cards	Film or fiche	Computer database
Space requirement	High	Very low	Minimal
Portability	None	High	High
Ease of updating	Difficult	Difficult	Instant
Multiple access points	No	Limited	Yes
Reader equipment	None	Required (microfilm reader)	Computer terminal
Cost	Moderate	Moderate	High (initial), low (maintenance)
Durability	Moderate	High	Depends on system backup
Best suited for	Periodical listings, records	Archival catalogues	Modern libraries, OPACs

26.5 Summary

- **Visible Index:** Transitional, limited use — mainly for current records and visuals.
- **Microform:** Compact and durable, but less interactive — good for archives.
- **Machine-Readable (MARC / OPAC):** Fully digital, dynamic, and user-friendly — the dominant form in modern libraries.

26.6 Essence

The evolution from **Book → Card → Sheaf → Visible Index → Microform → OPAC** represents the steady move from **manual to mechanical to digital cataloguing** — a journey toward speed, accessibility, and global connectivity in library services.

27. Inner or Kinds (Internal) Forms of Library Catalogue

The *inner* or *internal* form of a library catalogue refers to the **method of arranging and constructing entries** within the catalogue.

It determines how information is organized and how readers approach it — by author, title, subject, or classification.

Broadly, there are **three types** of inner forms:

1. **Alphabetical Catalogue**
2. **Classified Catalogue**
3. **Alphabetic-Classed Catalogue**

27.1 Alphabetical Catalogue

An **alphabetical catalogue** is arranged alphabetically by certain headings such as *author, title,* or *subject.*

It is the most familiar and widely used form, especially in public and academic libraries.

Alphabetical catalogues can take several forms:

(a) **Author Catalogue**

(b) **Title Catalogue**

(c) **Name Catalogue**

(d) **Alphabetical Subject Catalogue**

(e) **Dictionary Catalogue**

27.1.1 Author Catalogue

Definition:

An *Author Catalogue* arranges entries **alphabetically by author's name** (including editors, translators, or compilers).

It shows all works by a given author available in the library, or whether the library owns a specific book by that author.

Example:

- *Tagore, Rabindranath — Gitanjali*
- *Ranganathan, S. R. — Five Laws of Library Science*

27.1.1.1 Advantages

1. Brings **all works of one author together** at one place.
2. Helps determine whether the library has a **specific work by a specific author.**

27.1.1.2 Disadvantages

1. A *pure author catalogue* alone is insufficient — it ignores subject and title approaches.
2. Requires **added entries** for editors, translators, or collaborators.
3. Needs a **subject index** to provide additional access points.

27.1.2 Name Catalogue

Definition:

A *Name Catalogue* combines **author and subject catalogues** into one alphabetical sequence, where entries are made under personal names — both as **authors** and **subjects**.

Examples:

Entry Type	Example
Author	Basant, Annie (author)
Name Title	Chaucer: *Critical Study*
Corporate Author	Delhi University (author)
Biography	Gandhi, M. K. – *Biography*
Name Series	Ranganathan Series
Translator	Sen, Prafulla Kumar, tr.
Illustrator	Tagore, Abindranath, ill.

Purpose:

To bring together all works *by* and *about* a person in one alphabetical sequence.

27.1.3 Alphabetical Subject Catalogue

Definition:

In this form, entries are made **under the name of the specific subject** of each book, arranged in **strict alphabetical order.**

Example:

- *Botany – Textbooks*
- *Economics – India*
- *Library Science – Cataloguing*

Advantages:

- Enables readers to locate books directly under the subject of interest.

Limitation:

- Satisfies only subject approach; no access through author or title.

27.1.4 Title Catalogue

Definition:

A *Title Catalogue* lists books under their **titles**, arranged alphabetically.

It is particularly useful for **classical, ancient, or oriental works** where the title carries unique recognition.

Example:

- *Mahabharata*
- *Gita Govinda*
- *Shakuntalam*

Note:

Pure title catalogues are rare today; title entries are usually part of **dictionary catalogues** or **added entries**.

27.1.5 Dictionary Catalogue

Definition:

According to the *ALA Glossary of Library Terms*:

"A catalogue, usually on cards, in which all entries — author, title, subject, and series — with related references, are arranged together in one general alphabet."

Ranganathan's Definition:

"A catalogue in which all the entries are word entries, arranged alphabetically like a dictionary, consisting of one part only."

Origin:

Developed and popularized by **Charles Ammi Cutter** (Rules for a Dictionary Catalogue, 1876).

Dominant in **American libraries.**

27.1.5.1 Advantages

1. **Simple to use** – Readers understand alphabetical order easily.

2. **Single sequence** – All entries (author, title, subject, series) are in one alphabetical list.
3. **Comprehensive approach** – Serves multiple access points (author, title, subject).
4. **Abundant cross-references** – *See* and *See also* references link related topics.
5. **Direct access** – Readers can search under any known element (author, title, series, etc.).
6. **Useful for general readers** – Especially in public libraries.
7. **Groups related subjects** – Entries like "India, Architecture," "India, Music," etc., appear close together.

Example:

Heading	Example Entry
India, Architecture	NA44
India, Economics	X44
India, Painting	NQ44
India, Music	NR44

All appear alphabetically under *India*.

27.1.5.2 Disadvantages

1. **Scattered arrangement** – Related subjects may be widely separated alphabetically.
2. **Dependence on exact terminology** – Reader must use the correct term to find material (e.g., "Chess" vs. "Indoor Games").
3. **Excessive references** – *See also* links may irritate readers.
4. **Complex for research use** – Limited value for advanced or subject-based searching.
5. **Terminology updates required** – Changes in subject terms mean retyping thousands of cards.
6. **Unsystematic display** – Lacks logical or hierarchical order among subjects.

27.2 Classified Catalogue

Definition (Ranganathan):

"A catalogue in which some entries are number entries and some are word entries."

It consists of **two parts**:

1. **Classified Part** – Includes all *number entries* (main entries, cross-reference entries).
2. **Alphabetical Part** – Includes all *word entries* (book index entries, class index entries, cross-reference index entries).

Other Definitions:

- *Margaret Mann:* "A subject catalogue in which entries are arranged by a recognized system of classification."
- *H. A. Sharp:* "A catalogue arranging entries systematically by subject according to the classification scheme used for shelving."

Purpose:

The *Classified Catalogue* displays a **connected panorama of knowledge** — showing the relationship among broader, narrower, and related subjects.

It helps readers find books even when they cannot express the exact subject name.

27.2.1 Advantages

1. **Logical arrangement** – Brings together related subjects under one framework.
2. **Shows connections** – Displays broader and narrower subject relationships.
3. **Enhances subject familiarity** – Readers see the subject and its subdivisions together.
4. **Reveals library's strengths and gaps** by subject.
5. **Supports cooperative cataloguing** when based on standard schemes (DDC, CC, UDC).
6. **Subject catalogues can be printed easily** for specific topics.
7. **Terminology changes** affect only the alphabetical index, not the main part.
8. **Economical** – Easy to compile and maintain.
9. **Multiple readers can consult** (classified and alphabetical parts separately).
10. **Comprehensive view** – Shows subject hierarchy, aiding research and study.

27.2.2 Disadvantages

1. **Two-step search process** – Reader must consult the alphabetical index first, then classified section.
2. **Not user-friendly** – Requires familiarity with the classification notation.
3. **Needs regular revision** – As knowledge grows, classifications must be updated.
4. **Limited appeal to general readers** – Preferred mainly in research or academic libraries.

27.3 Alphabetic-Classed Catalogue

Definition (Cutter):

"An alphabetic subject catalogue in which subjects are grouped in broad classes with numerous alphabetic sub-divisions. It may also include author and title entries in the same alphabet."

Structure:

This hybrid catalogue blends **alphabetical** and **classified** features.

Two possible arrangements:

Method	Arrangement
(i)	Major subjects arranged in *classified order*, subtopics arranged alphabetically within each major class.
(ii)	Major subjects arranged *alphabetically*, subtopics arranged in *classified sequence* within each.

Example (Method i):

Major Subject	Subtopics (Alphabetically arranged)
Physics	Dynamics, Electricity, Gases, Heat, Light, Magnetism
Chemistry	Analytical, Inorganic, Organic, Physical

Example (Method ii):

Major Subject (Alphabetical)	Subtopics (Classified sequence)
Mathematics	Arithmetic → Algebra → Geometry → Trigonometry
Technology	Civil → Mechanical → Electrical → Chemical

27.3.1 Features and Advantages

1. **Combines strengths** of both alphabetical and classified catalogues.
2. **Logical and user-friendly** – Related subjects grouped together; easy alphabetical access retained.
3. **Facilitates browsing** – Reader can explore a topic and its related fields conveniently.

4. **Flexible structure** – Can adapt to both scholarly and general libraries.

27.3.2 Limitations

1. **Limited experimentation** – Has not been fully tested in practice.
2. **Complex organization** – Requires careful planning of class-subject relationships.
3. **Maintenance difficulty** – Adding new topics may disturb both alphabetical and classified order.

27.4 Summary Comparison

Feature	Alphabetical Catalogue	Classified Catalogue	Alphabetic-Classed Catalogue
Arrangement	Alphabetical (by author, title, or subject)	By class number / notation	Mixed (alphabetical + classified)
Approach	Direct	Indirect (two-step)	Both direct and logical
Relation of subjects	Scattered	Grouped logically	Grouped logically and alphabetically
Ease of use	Very easy	Requires classification knowledge	Moderate
Best suited for	Public/general libraries	Research/academic libraries	Specialized or hybrid libraries

27.5 Essence

The **form of a library catalogue** determines how efficiently a reader can locate and relate information.

- The **Alphabetical Catalogue** serves simplicity and accessibility.
- The **Classified Catalogue** emphasizes logic and subject relation.
- The **Alphabetic-Classed Catalogue** seeks to balance both — combining **clarity with structure**.

Together, these forms illustrate the continuing evolution of catalogues — from the purely alphabetical order of Cutter's day to the logical subject arrangements inspired by Ranganathan.

28. Cataloguing Practical: Preparation and Filing of Entries

Cataloguing practice is not limited to just preparing entries. For a catalogue to serve its true purpose, **entries must also be filed and arranged** in a way that readers can easily locate them.

Accordingly, cataloguing practical work is divided into two main parts:

1. **Preparation of Entries**
2. **Filing of Entries**

28.1 Importance of Filing

Preparation of catalogue entries alone is not enough. A well-prepared catalogue can still fail its users if entries are **not filed logically or consistently**.

Many readers either do not consult the catalogue or find it confusing because of poor filing methods.

As **H. A. Sharp** rightly observed:

"It should be remembered — and it is not always remembered — that the catalogue will be used largely by people who have little knowledge of the rules of alphabetization other than those that come to them by instinct or through common usage adopted in such everyday books of reference as directories and dictionaries."

Hence, **filing rules** must be **logical, simple, and user-oriented.**

28.2 Major Sources of Filing Rules

Rules for filing catalogue entries are included in several cataloguing codes.

The most notable among them are:

1. **ALA Rules for Filing Catalogue Cards**
2. **British Standards Institution (BSI): Alphabetical Arrangement**
3. **Indian Standards Institution (ISI): Practice for Alphabetical Arrangement**
4. **Ranganathan's Filing Rules** (in *Classified Catalogue Code*, 5th edition)

In this section, focus is given to:

- **Ranganathan's Filing Rules (CCC, 5th ed.)**
- **ALA Rules for Filing Catalogue Cards (2nd ed.)**

28.3 Meaning of Filing

Filing means **arranging catalogue entries in a systematic and consistent order** so that users can locate items quickly.

At first glance, filing may appear simple, but as a catalogue grows in size, filing becomes increasingly complex.

Even **Charles Ammi Cutter**, the father of modern cataloguing, recognized its importance. He included detailed filing rules (pp. 111–129) in his *Rules for a Dictionary Catalogue.*

28.3.1 Types of Filing Arrangements

Filing may be broadly classified into two groups:

1. **Classified Arrangement of Entries**
2. **Alphabetical Arrangement of Entries**

28.4 Classified Arrangement of Entries

Ranganathan, being the **strong advocate of the bipartite classified catalogue**, designed specific rules for filing entries in the **classified part** of the *Classified Catalogue Code (CCC).*

According to him, the classified catalogue has two main parts:

1. **Classified Part**
2. **Alphabetical Part**

28.4.1 Ranganathan's Rules for Classified Arrangement

In his *CCC* (5th ed.), Ranganathan included filing rules based on the **Colon Classification (CC)** scheme, especially to handle its **mixed notation** system.

He provided detailed guidelines in Rules **024**, **025**, and **025.1**, and additional suggestions on pages 108–109 of *CCC.*

28.4.1.1 Basic Principle

Entries in the classified part should be **arranged by their class numbers** as given in their leading sections.

To achieve consistent filing, Ranganathan **assigned ordinal values** to symbols and digits used in his Colon Classification.

28.4.2 Ordinal Values of Symbols and Digits

(a) In Colon Classification (6th Revised Edition)

The ascending order of filing digits and symbols is:

) ← → 0 „ . : ; , – a b … z 1 2 … 9 A … Z (

(b) In Colon Classification (7th Edition)

The updated order is:

- " ←) & „ . : ; - , = + → a b … z 0 1 2 … 8 9 A … Z (

This order ensures uniform placement of mixed notation elements — punctuation marks, numbers, and alphabets — during filing.

28.4.3 Additional Rules for Entries with Same Class Number

Ranganathan provided several detailed rules (coded EG21–EG32) for arranging entries that have identical class numbers in their leading sections.

Rule EG21:

"Among entries with the same class number in their respective leading sections, those with one or more book numbers are to have precedence over those without them."

Explanation:

Entries with **book numbers** are **Main Entries**, while those **without book numbers** are **Cross-Reference Entries**.

Therefore:

Main Entries always take precedence over Cross-Reference Entries.

Example:

Entry Type	Class No.	Book No.	Order
Main Entry	X44	M3	1st
Cross Reference Entry	X44	—	2nd

Rule EG22:

"Entries with book numbers in their respective leading sections are to be arranged among themselves by their book numbers."

Illustration:

Class No.	Book No.	Order
X44	A1	1st
X44	A5	2nd
X44	A8	3rd

Hence, among main entries, order depends on **ascending book numbers**.

Rule EG31:

"Entries with the same class number and without book numbers in their leading sections are to be arranged among themselves by the book numbers, if any, in their respective third sections."

Meaning:

If entries have identical class numbers in their leading section and no book numbers there, look for the **book number in the third section** and arrange accordingly.

Example:

Entry	Class No. (Leading)	Book No. (Third Section)	Order
Entry 1	L183	B3	1st
Entry 2	L183	C1	2nd

Rule EG32:

"Such entries under Rule 31 as have the same book numbers in their third sections are to be arranged among themselves by the class numbers occurring in their third sections."

Explanation:

If book numbers in the third section are the same, the order is decided by **class numbers** in the same section.

28.4.4 Summary of Ranganathan's Classified Filing Rules

Rule No.	Criterion	Priority Basis
EG21	Entries with and without book numbers	Entries *with* book numbers first
EG22	Entries with book numbers	Arrange by ascending book numbers
EG31	Same class number, no book numbers	Arrange by third-section book numbers
EG32	Same third-section book numbers	Arrange by third-section class numbers

28.5 Alphabetical Arrangement of Entries

In the **alphabetical part** of the *CCC* and in **dictionary catalogues**, entries are arranged **word by word or letter by letter** in strict alphabetical order.

Ranganathan, ALA, and BSI all provide filing rules for such arrangements — dealing with:

- Articles ("a," "an," "the")
- Abbreviations
- Numbers and symbols
- Punctuation and spacing
- Names with prefixes (e.g., *de, von, St.*)
- Compound words and phrases

(A detailed comparative study of alphabetical filing rules can follow next, if needed.)

28.6 Summary

- **Filing** is the process of arranging entries so they can be easily retrieved.
- Proper filing is as important as accurate cataloguing.
- **Ranganathan's filing rules** integrate logical order and bibliographic precision, especially suited for **Classified Catalogues** using **Colon Classification.**
- Filing must prioritize **clarity, consistency, and user convenience**, since most readers rely on instinctive alphabetical habits.

28.7 Essence

Cataloguing without systematic filing is like **a library without order** — everything exists, but nothing is truly accessible.

Ranganathan's filing principles ensured that **structure, precision, and usability** coexist, turning catalogues into genuine retrieval tools rather than mere lists.

29. Alphabetical Arrangement and Alphabetization

Alphabetical arrangement lies at the heart of **dictionary catalogues** and the **alphabetical part** of classified catalogues.

Despite its apparent simplicity, alphabetization presents several **technical and interpretive challenges**, and experts have differed over its rules and methods.

As a result, **no single standard system** of alphabetization has gained universal acceptance.

This often causes **inconvenience to readers**, who expect catalogues to follow the intuitive order they know from dictionaries or directories.

29.1 Basic Principles of Alphabetization

There are **two main principles** of alphabetical arrangement:

1. **Letter-by-Letter Arrangement**

   (Also called *All-through Arrangement*)

   - Each **letter** is treated as a unit, without regard to spaces or punctuation.
   - Arrangement proceeds continuously from the first to the last letter.

2. **Word-by-Word Arrangement**

   (Also called *Nothing-before-Something Arrangement*)

   - Each **word** is treated as a separate unit.
   - A shorter word (complete) precedes a longer word that begins with it.

29.2 Illustration

Example: Difference between Letter-by-Letter and Word-by-Word Arrangement

Order	Letter-by-Letter Arrangement	Word-by-Word Arrangement
1	Hindu	Hindu
2	Hindi Civilization	Hindu Civilization
3	Hindukush	Hindu Law
4	Hindu Law	Hindu Law Digest
5	Hindu Law Digest	Hindu Philosophy
6	Hindu Philosophy	Hindu Pilgrimage
7	Hindu Pilgrimage	Hindu Service Organization
8	Hindu Service Organization	Hindu Society
9	Hindu Society	Hindu State
10	Hindu State	Hindu Temple
11	Hindu Temple	Hindukush

Note:

- In *Letter-by-Letter Arrangement*, "**Hindukush**" comes third.
- In *Word-by-Word Arrangement*, "**Hindukush**" comes last.

29.3 Kinds of Alphabetization

1. **Gestalt Alphabetization**

- Assigns **ordinal values** to spaces and punctuation (e.g., word space, sentence space, paragraph space).
- Distinguishes between **capital letters**, **small letters**, and **italics**.
- Follows psychological grouping ("whole-word" perception).

2. **All-through Alphabetization**
   - Ignores all distinctions such as word spaces, punctuation, and letter forms.
   - Sequences letters **continuously**, treating them equally.
   - Used widely in modern cataloguing for simplicity and consistency.

29.4 Ranganathan's Approach to Alphabetization

Dr. S. R. Ranganathan proposed a **middle path** between these two extremes.

In his *Classified Catalogue Code (CCC)*, he **mechanized the arrangement of entries** by integrating the **rules of writing and alphabetization** in Chapter *ED*.

Ranganathan adopted the **Letter-by-Letter principle** in his *CCC*.

29.4.1 Justification for Letter-by-Letter Principle

According to Ranganathan:

"Many persons write one word of their names in two or more words.

Under the Word-by-Word principle, entries for the same person would get scattered — causing inconvenience to users."

Example:

Variation in Name	Treated As (Letter-by-Letter)
Jagjiwanram	Jagjiwanram
Jag-jiwan-ram	Jagjiwanram
Jag Jiwan Ram	Jagjiwanram

Thus, **all variants file together** under one continuous form of the name.

29.5 Ranganathan's Rules for Alphabetical Arrangement

Ranganathan's detailed filing rules are included in **Chapters EG and EH** of *CCC*.

Some key rules are summarized below.

EH1

"The entries in the alphabetical part are to be arranged strictly by the alphabets, as in a dictionary."

Meaning:

Follow continuous *letter-by-letter* arrangement without distinction of word boundaries.

EH2

"In an alphabetical arrangement, no attention is to be paid to initial articles (a, an, the)."

Example:

- *The Indian Library Association* → filed under **Indian**, not **The**.

EH31

"German words spelled with the vowels ä, ö, and ü are to be arranged as if they were a, o, and u respectively."

Example:

- *Müller* → filed as **Muller**
- *Göthe* → filed as **Gothe**

EH4

"Scottish names with the prefix *Mac*, *Mc*, or *M'* are to be arranged according to their apparent alphabetical make-up."

Example:

- *Macdonald*, *McDonald*, *M'Donald* → all treated as **Macdonald** and filed together.

EH5

"Similar treatment should be given to names beginning with *St* and *Ste*. Use cross-references to connect the names."

Example:

- *St. John*, *Stevenson*, and *Stirling* are treated as **Stjohn**, **Stevenson**, **Stirling** respectively, but cross-references should connect "St" and "Saint."

EH70

"The following ascending scale of ordinal values should be observed in arranging entries in the alphabetical part."

29.6 Ordinal Values in Alphabetization

Order of Precedence (from lower to higher)	Symbol/Feature	Remarks / Example
1	Section space	Used for separation between major divisions
2	Full stop (.)	*e.g., Dr., Mr., etc.*
3	Comma (,)	For sub-arrangement within same heading
4	Numerals	Arranged in natural order (1, 2, 3...)
5	Brackets ( )	Treated after numerals
6	Words in Roman letters	Regular English alphabet words
7	Words in italics / underlined	Treated after Roman words
8	Word "and" or semicolon (;)	Treated later in sequence
9	"Etc."	Comes last among same entries

29.7 Illustration

The following example illustrates the **ascending sequence** as per Ranganathan's EH70 rule.

Example: "JABALPUR" and related entries

Order	Entry
1	JABALPUR
2	JABALPUR (See also JABBALPORE)
3	JABALPUR, BIBLIOGRAPHY
4	JABALPUR, PUBLIC WORKS (Department of -)
5	JABALPUR 1

6	JABALPUR 2
7	JABALPUR 3
8	JABALPUR (City)
9	JABALPUR (District)
10	JABALPUR (Division)
11	JABALPUR RELIGIOUS ASSOCIATION
12	JABALPUR RELIGIOUS ASSOCIATION, DONATION (Section)
13	JABALPUR RELIGIOUS ASSOCIATION, Ed.
14	JABALPUR RELIGIOUS ASSOCIATION AND BHOPAL RELIGIOUS ASSOCIATION

Here, Ranganathan's ordinal scale dictates that **punctuation, numerals, and parentheses** follow in that precise hierarchy — ensuring consistent filing.

29.8 Summary of Ranganathan's Alphabetization Rules

Rule No.	Principle / Basis	Key Feature
EH1	Letter-by-letter arrangement	Continuous order, dictionary style
EH2	Ignore initial articles	"A," "An," "The" not counted
EH31	German vowels	ä, ö, ü → a, o, u
EH4	Scottish prefixes	"Mac," "Mc," "M'" treated alike
EH5	Prefixes "St" and "Ste"	Treated alphabetically, cross-referenced
EH70	Ordinal scale	Defines order of symbols, punctuation, numerals

29.9 Comparative Note: ALA vs. Ranganathan

Aspect	ALA Rules	Ranganathan's CCC
Basic system	Word-by-word	Letter-by-letter
Articles (a, an, the)	Ignored	Ignored
Prefixes (Mac, St)	Alphabetized literally	Treated equivalently (cross-referenced)
Spaces and punctuation	Ignored except hyphens	Assigned specific ordinal value
Consistency	Follows dictionary pattern	Mechanized and integrated in CCC

29.10 Essence

Alphabetization is both a **mechanical and interpretive act** — a balance between logic and human expectation.

Ranganathan's method offers **precision and predictability**, especially suited for **mechanized or large catalogues**.

While the **ALA system** mirrors natural language and dictionary habits, **Ranganathan's "all-through" method** ensures consistency across multilingual and compound entries.

Together, they illustrate two philosophies of order —

one based on *reader instinct*, and the other on *cataloguer precision.*

30. ALA Filing Rules — concise, numbered notes (keep numbering continued)

Below I've distilled the ALA filing guidance you pasted into a compact, study-friendly form — same numbering flow, tables where helpful, and six clear examples at the end.

30.1 Basic order (core principle)

1. **Basic order = Alphabetical «word-by-word»** (the ALA default).
    - Treat the *space between words as "nothing"* → "nothing before something."
    - Exceptions where **numerical/chronological** order is preferable (e.g., issues, volumes).

2. **Interfile different kinds of entries together** (author, title, subject, series) in a single alphabet unless a special order is required.
3. **Personal surname entries** are normally placed before other entries that begin with the same word or word group.

30.2 Alphabetical arrangement (key rules)

- **Word-by-word order**: compare word1, then word2, etc. (ignore initial articles).
- **Ignore initial articles** in any language (A, An, The, Le, La, Das, etc.), except a couple of specific exceptions noted in full ALA text.
- **Disregard punctuation** that is part of titles or corporate names for filing purposes.
- **Interfile different forms of the same letters**: treat X Y Z ; X.Y.Z ; X Y. Z. as XYZ (see initials rules).

30.3 Special rules (short cheat-sheet)

- **Initials** (single or grouped): treat them as one-letter words and file them *before* longer words beginning with the same letter (A, A.A., A.A.A. Foundation...).
- **Spacing & punctuation variants**: disregard variations — file X Y Z, X.Y.Z., XYZ as the same.
- **Acronyms**: file as words unless written with spaces/periods between capitals (so UNESCO behaves like a word; U.N.E.S.C.O. may be treated similarly but watch local practice).
- **Abbreviations**: file as if spelled out in the language of the entry (unless meaning is uncertain → file as written).
- **Geographical initials/abbrev.**: expand for filing if the expansion is commonly known (e.g., U.S. → United States).
- **Numerals in headings/titles**: file **as if spelled out** in the language of the entry (e.g., "1100" → "eleven hundred"; "3½" → "three and a half").
- **Variant spellings / hyphenation**: interfile variant spellings and hyphenation forms together; choose the established heading if present, otherwise use predominant or dictionary form. Use explanatory cross-references from the unused forms.

30.4 Order of different kinds of entries beginning with the same word (ALA structure)

When the **same word/group** heads several different kinds of entry, ALA prescribes two broad groups and suborders.

30.4.1 Two main groups

1. **Single surname entries** — arranged alphabetically by forenames/initials.
2. **All other entries** — arranged *word-by-word*, disregarding entry kind and punctuation (but single surnames still precede).

30.4.2 Within a single-surname heading (19B1)

Order the differing entry types under that surname as:

1. **Author (main and/or added entry)**
2. **Subject (without subdivision)**

3. **Subject (with subdivision)**

30.4.3 Under compound/given names & corporate names (19B2 & 28C)

- For **compound/given names**, same threefold grouping as single surnames.
- For **corporate entries**, order is:
    1. **Author (main/added)** — without subheading (subarrange by titles).
    2. **Subject without subdivision** — interfile with identical title entries and subarrange alphabetically by main entry.
    3. **Name with corporate/subject subdivisions** — subdivisions interfiled alphabetically with each other and with titles; each corporate author heading followed by its non-subject entries.

Result: corporate author entries (organization as author) come before subject entries and before titles under the same heading.

30.5 Practical filing details (selected operational rules)

- **Initials vs full forename:** initials precede full forenames when initial and name share the same starting letter (Mikes, G. before Mikes, Gerald).
- **Designations (Mr., Dr., Sir, Prof.)**: *disregard* unless needed to disambiguate otherwise identical names.
- **Compound forms & hyphens:** two-word (or hyphenated) forms file under the one-word form (i.e., treat "Self-help" under "Selfhelp" ordering rules).
- **Choice of national spelling:** use local variant (US library → American spellings; UK/Indian library → British spellings); create cross-references from alternative forms.
- **When multiple identical headings** (e.g., identical title & subject): interfile title added entries and subject entries; subarrange alphabetically by main entries; title main entries precede identical entries with an author.

30.6 Compact table: order under same heading (useful reference)

Position	Entry type (typical ALA order)
1	Single surname — personal author (main/added)
2	Single surname — subject (no subdivision)
3	Single surname — subject (with subdivision)
4	Compound/given name — personal author
5	Corporate author — as author (without subheading)
6	Corporate — subject (no subdivision) / identical title entries (interfiled)
7	Corporate — subject with subdivisions / titles (interfiled alphabetically)

30.7 Six clear examples (practical filing outcomes)

1. **Initials vs name**
    - A., A.A., A.A.A. Foundation for Traffic Safety → files before A.B. and before words beginning with A-.
2. **Initial variants**
    - X.Y.Z., X Y Z, XYZ → all treated the same and filed together as XYZ.
3. **Acronym vs expanded**

- UNESCO (files as U N E S C O as a word) — cross-reference from United Nations Educational, Scientific and Cultural Organization.

4. **Numeral in title**
   - 1100 Years of... → file under “Eleven hundred Years of...” (i.e., as if spelled out).
5. **Surname group order**
   - Under Corbett: Corbett, J. → Corbett, Hunter → Corbett, Mr. → Corbett, Mrs. → Corbett, Nicholas (designations ignored except to order if needed).
6. **Corporate ordering**
   - For World Health Organization:
     1. World Health Organization (author heading)
     2. WORLD HEALTH ORGANIZATION (subject heading)
     3. World Health Organization and its activities (title)
     4. WORLD HEALTH ORGANIZATION, LIBRARY (subject with subdivision)

30.8 Quick practice tips for implementers

- Choose **one master policy** (ALA or local variant) and document it — consistency matters more than theoretical 'best'.
- Maintain **cross-references** liberally for alternative spellings, abbreviations, and acronyms (users rely on them).
- Decide **national spelling policy** once and apply it across the catalogue; automate crossrefs for common variants.
- For computerized catalogues (OPACs), preserve these filing logics but enable **tokenized** searching so users needn’t memorize precise order — still keep printed or exported lists sorted per rules.

31. Classified Catalogue (CCC) — Main entries & structure (continuing numbering)

Nice — we’ll keep the numbering rolling. Below are concise, topic-wise notes on **Classified Catalogue** (per Ranganathan’s *Classified Catalogue Code*), with tables where helpful and **six practical examples** at the end.

31.1 Overview

- **Classified catalogue (CCC)** = catalogue in which entries are **number entries** (classified part) and **word entries** (alphabetical part).
- **Classified part**: *Main entries + Cross reference entries* (numbered, mirror shelf order).
- **Alphabetical part**: *Class index entries*, *Book index entries*, *Cross-reference index entries* (word-based access points).

31.2 Entry — definition & types

- **Entry (CCC):** the *ultimate unit record* in a catalogue — the complete descriptive unit for a document.
- **Two types:**
  1. **Main entry** — the primary full record (one per document).
  2. **Added entries** — secondary/derived access points (author, title, subject, series, etc.).

31.3 Main entry — definition & functions

Definition (CCC): "a specific entry giving maximum information about the whole of a document. All other entries… are normally derived from the main entry."

Primary functions

1. Reflects shelf order — helps locate the physical book.
2. Gives full bibliographic detail (title, edition, collaborators, series, etc.).
3. Serves as the *source* (key) for preparing added entries.
4. Facilitates removal/tracing when a document is withdrawn or lost.
5. Exactly one main entry per document — helps count holdings by subject.

31.4 Structure of the main entry (six sections)

Section No.	Name	Purpose / Content (how recorded)
1	**Leading section**	Call number (class number + book number; collection no. above book no.). Written starting at first vertical of card; no full stop (ED87).
2	**Heading section**	Entry element (in BLOCK letters), Secondary element (in parentheses), Individualizing element (in further parentheses). Starts at second vertical; ends with a full stop (ED86).
3	**Title section**	(i) Title & subtitle; (ii) Edition statement (if not 1st); (iii) Collaborator statement (editor/translator). Starts on line after heading.
4	**Note section**	Series note or other notes (e.g., series name, editor of series, series no.). Given in parentheses; each subsection ends with a full stop (MF11, ED83).
5	**Accession number**	Placed at first vertical on last line; no full stop after it (ED45, ED87).
6	**Tracing** (back of card)	Back side: left half — one line per Cross Reference Entry (class no. + locator). Right half — upper: Class Index headings; middle: Book Index headings; lower: Cross-reference index headings. Continuation indicated by two spaces; each heading ends in a full stop (MH4–MH7, MH92–MH93).

31.5 Notes on recording practice

- **Leading section**: call numbers usually pencilled (possible changes). Book-number follows class number after a double space.
- **Heading section**: follow **ED rules** for capitalization and brackets: entry element in BLOCK, secondary/individualizing elements in ( ).
- **Note/Series**: record exactly from half-title/series page; if no serial no. exists, assign sequence by accession order or year.
- **Tracing layout** (back of card) is standardized so index lookups and cross-references are quick.

31.6 Tracing — quick schematic (back of main entry card)

Back half	Content
Left half (lines)	Each line = one Cross Reference Entry (class number + P / Sec / Chap / Part + number).
Right half — upper part	Class Index headings (Class Index Entries).
Right half — middle part	Book Index headings (author/title index entries).
Right half — lower part	Cross Reference Index headings (see/see also).

(Continuation lines: indent by two spaces; close each heading with a full stop.)

31.7 Practical implications for holdings & maintenance

- **Holdings are visible** via main entries: number of main entries in a class = holdings count for that subject.
- **Withdrawals**: remove main entry and all added entries — tracing speeds this up.
- **New acquisitions**: create one main entry with full tracing; generate added entries from it (book index, class index, cross refs).
- **Consistency:** strict adherence to ED/MB/MF/MH rules ensures uniformity across cards and ease of filing.

31.8 Six worked examples (sample main entry cards — condensed)

Below are six short simulated main-entry lines (front of card) and brief tracing notes (back). Use them as templates.

Example 1 — Monograph with single author

- *Front (leading → heading → title → accession)*

  501.42 B15

  BROWN, JAMES.

  Fundamentals of Biochemistry. 3rd ed. / James Brown.

  (Biochemistry Series. Ed. by R. Smith. 12.)

  Acc. No.: 2023/145

- *Back (tracing)*

  Left half: 501.42 P Sec 3

  Right upper: BIOCHEMISTRY (Class index)

  Middle: BROWN, JAMES. (Book index)

  Lower: See ALSO: BIOCHEMISTRY & MOLECULAR BIOLOGY.

Example 2 — Corporate author

- *Front*

  332.422 W01

  WORLD BANK.

  Global Monetary Policies / World Bank.

(Series: World Economic Reports. 45.)

Acc. No.: 2024/007

- *Back*

  Left: 332.422 P Chap 2

  Right upper: MONETARY STANDARDS

  Middle: WORLD BANK

  Lower: See: INTERNATIONAL FINANCE.

Example 3 — Edited volume (collaborator)

- *Front*

  005.8 K09

  KUMAR, R.

  Advances in Database Systems / ed. by R. Kumar.

  (Computing Advances Series.)

  Acc. No.: 2022/312

- *Back*

  Left: 005.8 P Sec 1

  Right upper: DATABASES

  Middle: KUMAR, R. (ed.)

  Lower: See ALSO: INFORMATION RETRIEVAL.

Example 4 — Book in a series without series number (assign accession-based)

- *Front*

  940.2 S22

  SMITH, A.

  History of Modern Europe. / A. Smith.

  (European Studies) ← (no series no. → library assigns 1 by accession)

  Acc. No.: 2020/089

- *Back*

  Left: 940.2 P Part 1

  Right upper: EUROPE — HISTORY

  Middle: SMITH, A.

  Lower: See: MODERN HISTORY.

Example 5 — Multivolume work (book number shows volume)

- *Front*

  620.3 P05 v.2

  PATEL, S.

  Mechanical Engineering: Principles, v.2 / S. Patel.

(Vol.2)

Acc. No.: 2019/450

- *Back*

  Left: 620.3 P Sec 10

  Right upper: MECHANICAL ENGINEERING

  Middle: PATEL, S.

  Lower: See ALSO: ENGINEERING DESIGN.

Example 6 — Local collection indicator present

- *Front*

  801.9 R02 (RARE)

  RAVINDRANATH, T.

  Ancient Poems of Kerala / T. Ravindranath.

  (Rare Collection.)

  Acc. No.: R/195/001

- *Back*

  Left: 801.9 P Chap 1

  Right upper: POETRY — KERALA

  Middle: RAVINDRANATH, T.

  Lower: See: MALAYALAM LITERATURE.

31.9 Quick checklist for cataloguers (practical)

- Record **leading section** first (call no. + book number).
- Render **entry element in BLOCK**; secondary/individualizing elements in ( ).
- Capture **title / edition / collaborators** exactly as in the book.
- Note **series** on note line (if none, assign library sequence if needed).
- Place **accession number** in its fixed place (last line, first vertical).
- Prepare **tracing** on back: cross-refs (left), class-index (upper right), book-index (middle right), cross-ref-index (lower right).
- Use **two-space indent** for continuation lines; end headings with a full stop.

32. Added Entries of Classified Catalogue (CCC)

Continuing from the previous section, here's a clear and compact explanation of **added entries** under Ranganathan's *Classified Catalogue Code (CCC)* — organized for easy memorization and use in cataloguing practice.

32.1 Definition

Added Entry (CCC):

"An entry other than the main entry."

It provides **alternative access points** to a document and helps readers reach the same item from different approaches — subject, author, title, or series.

In other words, the **main entry** is the *heart*, and added entries are the *arteries* connecting users to it.

32.2 Types of Added Entries

In the *Classified Catalogue (CCC)*, there are **four main types** of added entries, divided further as follows:

Main Type	Purpose / Basis	Sub-types (where applicable)
1. **Cross Reference Entry**	Connects related class numbers	—
2. **Class Index Entry**	Subject access through class term	—
3. **Book Index Entry (BIE)**	Word-based access through names/titles	(i) Author BIE (ii) Collaborator BIE (iii) Title BIE (iv) Series BIE
4. **Cross Reference Index Entry**	Connects related index headings	—

32.3 Functions of Added Entries

1. **Subject access:**

   Readers knowing only the *subject* can reach the right document through **Class Index Entries**.

2. **Avoids duplication:**

   One class index entry serves all books in a subject — prevents repeated subject entries.

3. **Author / collaborator / title / series access:**

   Book Index Entries meet these user approaches efficiently.

4. **Quantitative insight:**

   Added entries help estimate *how many* books exist under a subject, author, or series.

5. **Economy:**

   Cross Reference Index Entries act as general links — reduce the need for repetitive Book Index Entries.

6. **Guidance through relationships:**

   Cross Reference Index Entries guide users from one heading to another ("see" and "see also" links).

32.4 Structure and Format of Different Added Entries

32.4.1 Cross Reference Entry (CRE)

Definition:

"A specific added class number entry in a classified catalogue."

It connects a *related subject's class number* to the *locus* (location) in the host document.

Key points:

- Belongs to **Classified Part** (number entry).
- Corresponds to a *subject analytical entry* in a dictionary catalogue.
- Uses **class numbers** and "see also" direction.

Sections (in order):

1. **Leading section:** Class number (in pencil).

2. **Second section:** Directing element — "See also".
3. **Call number of the book.**
4. **Heading of the main entry** (omit secondary elements).
5. **Title and locus** — short title + place of occurrence (P, Sec, Chap, Part).

Example:

S13

See also

S1 K7

Dinkmeyer.

Child development. Ed.3. P 401–34.

32.4.2 Class Index Entry (CIE)

Definition:

"A subject entry which refers from the name of a class to its class number."

Nature:

Prepared from class numbers of both *main entries* and *cross reference entries*.

Rule KF0 — Sections:

1. **Leading section:** Class index heading (the subject word).
2. **Directing section:** Formula text —
   "For documents in this Class and its Subdivisions, see the Classified Part of the catalogue under the Class number …"
3. **Index number section:** Class number (in pencil).

Example:

CHILD, PSYCHOLOGY.

For documents in this Class and its Subdivisions,

see the Classified Part of the catalogue under the Class number S1.

32.4.3 Book Index Entry (BIE)

Definition:

"A specific added word entry in a classified catalogue."

Purpose:

Provides **word-based access** to the document — usually via author, collaborator, title, or series.

Four types of BIEs:

1. **Author / Joint Author**
2. **Collaborator / Joint Collaborator**
3. **Title (if fanciful or distinctive)**
4. **Series**

Structure of a Book Index Entry (Rule MK0)

Section	Content
1. **Leading section**	Heading — personal name, collaborator, title, or series name.
2. **Second section**	Short title of the document followed by edition statement (if not 1st).
3. **Index number section**	Call number (in pencil) aligned to the far right.
4. **Note section**	Used rarely — for extracts, change of title, or works warranting extraction note.

32.4.3.1 Author Book Index Entry

Rules:

- Heading = *name of author* (same as main entry unless it's eligible as a class index heading).
- For **two joint authors**, record **permutations of names**.
- For **more than two**, write first author + phrase "and others".
- Short title + edition recorded in the second section.
- Call number at rightmost edge of card.

Example:

DINKMEYER (Don C) (1905).

Child development. Ed.3. S1 K7

32.4.3.2 Collaborator Book Index Entry

Heading:

Name of collaborator (editor, translator, compiler, etc.)

Example:

SMITH (John) tr.

History of Europe. 940.2 S22

32.4.3.3 Title Book Index Entry

Used only for *fanciful* or *distinctive* titles, where the title itself is a natural access point.

Example:

WINGS OF FIRE.

By A.P.J. Abdul Kalam. 629.45 K15

32.4.3.4 Series Book Index Entry

Used for:

Series names when the reader may know the book only by series title.

Example:

CAMBRIDGE ECONOMIC STUDIES.

For documents in this series, see under the respective class numbers.

32.4.4 Cross Reference Index Entry (CRIE)

Purpose:

To connect related headings in the **alphabetical part** — analogous to "See" and "See also" references in a dictionary catalogue.

Types:

- **See references** — direct the user from a non-preferred to a preferred heading.
- **See also references** — connect related or broader/narrower headings.

Example:

ADOLESCENT PSYCHOLOGY.

See also CHILD DEVELOPMENT.

32.5 Summary of Entry Types and Locations

Type	Belongs to	Nature	Purpose / Function
Main Entry	Classified part	Number entry	Core record of the document
Cross Reference Entry	Classified part	Number entry	Connect related class numbers
Class Index Entry	Alphabetical part	Word entry	Access by subject/class term
Book Index Entry	Alphabetical part	Word entry	Access by author, title, collaborator, or series
Cross Reference Index Entry	Alphabetical part	Word entry	Link between related headings

32.6 Functional Summary

- **Classified part** = numerical logic, mirrors shelf arrangement.
- **Alphabetical part** = linguistic logic, mirrors user's mental approach.
- Together, they make the catalogue *systematic yet approachable* — Ranganathan's key innovation.

33. Collaborator, Title, Series & Cross-Reference Book Index Entries (CCC)

Continuing the sequence — this section summarizes the **remaining types of Book Index Entries** and the **Cross Reference Index Entry** as per *Classified Catalogue Code (CCC)* by Dr. S.R. Ranganathan, including structure, rules, and examples.

33.1 Collaborator Book Index Entry (CBIE)

Definition

A **Collaborator Book Index Entry** provides access to a document through the *name of a collaborator* such as an **editor, translator, compiler, illustrator**, or **reviser**.

It allows users who remember the collaborator, not the main author, to locate the book.

Structure of CBIE

Section	Content / Description
1. Leading Section	(i) Name of each collaborator, if only one is mentioned. (ii) Permutation of names, if two joint collaborators. (iii) Name of first collaborator followed by "and others," if three or more collaborators.
2. Second Section	Entry element(s) of author(s) in ordinary hand → followed by colon (:) → short title of book and edition statement. End with full stop.
3. Index Number Section	Call number of the book (in pencil) written as far to the right as possible.

Example 1 – Single collaborator

SMITH (John) tr.

Brown: Modern French Literature. 2nd ed. 840.9 B76

Example 2 – Two joint collaborators

TAYLOR (H.) and JONES (A.) eds.

Clark: Studies in Economic Theory. 330.1 C59

Example 3 – Three or more collaborators

ALLEN (M.) and others eds.

Singh: Advances in Microbiology. 579.1 S55

33.2 Title Book Index Entry (TBIE)

Definition

A **Title Book Index Entry** is prepared **only for fanciful or non-descriptive titles**, i.e., titles that do not directly reveal the subject matter of the book.

Structure of TBIE

Section	Description
1. Leading Section	First two words of the title in **BLOCK LETTERS** (omit initial articles and honorifics as per Rule JF3 & JF4).
2. Second Section	Connecting word **'by'** followed by heading of main entry (usually author's entry element) in ordinary hand; end with a full stop.
3. Index Number Section	Call number of the book in pencil, aligned to right.

Example 1

WINGS OF FIRE.

By Kalam (A.P.J. Abdul). 629.45 K15

Example 2

THE INVISIBLE HAND.

By Smith (Adam). 330.1 S65

Example 3

MIDNIGHT'S CHILDREN.

By Rushdie (Salman). 823.914 R87

33.3 Series Book Index Entry (SBIE)

Definition

A **Series Book Index Entry** provides access through the *series title* under which books are published. Useful when users identify books by the series name rather than the author or subject.

Structure of SBIE

Section	Description
1. Leading Section	Name of the series in **BLOCK LETTERS**, followed by a full stop.

2. Second Section	Serial number (or substitute) starting from first vertical; entry element of author (with descriptive element if any) in ordinary hand → colon → short title and edition statement. End with full stop.
3. Index Number Section	Call number of the book in pencil to the far right.

Example 1

CAMBRIDGE ECONOMIC STUDIES.

2 MARSHALL (A.): Principles of Economics. 8th ed. 330.1 M35

Example 2

OXFORD HISTORY SERIES.

15 GREEN (P.): Ancient Civilizations. 930.1 G73

Example 3

INDIAN SCIENCE LIBRARY.

5 SHARMA (R.): Physics for Beginners. 530.1 S53

33.4 Cross Reference Index Entry (CRIE)

Definition

A **Cross Reference Index Entry** is a **general added entry** that connects **one word or phrase to another synonymous or related word or phrase**.

It directs users from a non-preferred term to the preferred one.

33.4.1 Types of Cross Reference Index Entries (Rule LA3)

Type	Purpose / Description
1. **Alternative Name Entry**	Links different forms of the same personal name.
2. **Variant Form of Word Entry**	Connects variant spellings or forms of the same term.
3. **Pseudonym–Real Name Entry**	Connects pseudonym with the author's real name.
4. **Editor of Series Entry**	Links series editor's name to the series title.
5. **Generic Name Entry**	Connects general terms and their specific forms.

33.4.2 Structure of CRIE (General Form)

Section	Content / Description
1. Leading Section	Heading word or phrase (in BLOCK LETTERS); for persons, include forename and individualizing element in parentheses; append "Ed." if editor.
2. Second Section	The directing word **'See'** (or **'See also'** when linking related terms).
3. Referred-to Heading	The preferred heading or term to which the user is directed.

Example — *Editor of Series* Cross Reference Index Entry

SMITH (John) (1900) Ed.

See CAMBRIDGE ECONOMIC STUDIES.

Other Illustrative Examples

1. **Alternative Name Entry**
2. MARK TWAIN.

3. See CLEMENS (Samuel Langhorne).
4. **Variant Form of Word Entry**
5. LABOUR.
6. See also EMPLOYMENT.
7. **Pseudonym–Real Name Entry**
8. GEORGE ORWELL.
9. See BLAIR (Eric Arthur).
10. **Generic Name Entry**
11. BIRDS.
12. See also SPARROWS; EAGLES; PARROTS.

33.5 Quick Comparative Table of Added Entry Types

Type of Entry	Belongs To	Access Point	Example Heading	Example Reference
Cross Reference Entry	Classified Part	Subject / Class No.	S13	See also S1 Dinkmeyer.
Class Index Entry	Alphabetical Part	Subject Term	CHILD, PSYCHOLOGY	For documents in this class, see under S1.
Book Index Entry	Alphabetical Part	Author / Title / Series	DINKMEYER (Don C.)	Child development. Ed.3.
Cross Reference Index Entry	Alphabetical Part	Related Words / Names	SMITH (John) Ed.	See CAMBRIDGE ECONOMIC STUDIES.

34. Structure of AACR-2R (Anglo-American Cataloguing Rules, Second Revised Edition, 1988/1986 printing)

This section lays out the **framework and core logic of AACR-2R**, showing how it organizes descriptive and access-point cataloguing, the levels of description it recognizes, and the kinds of entries it defines.

34.1 Overview

AACR-2R (1986) is the **revised form of AACR-2 (1978)**, intended to standardize bibliographic description and the choice of access points for all kinds of materials.

It consists of **two major parts**, followed by **appendices** and an **index**.

34.2 Two Parts of AACR-2R

Part	Focus	Content Summary
Part I – Description	How to record *what* an item is.	13 chapters (1–13) cover general and special materials (books, maps, music, recordings, films, computer files, realia, microforms, serials, analytics).
Part II – Headings, Uniform Titles & References	How to decide *under which heading* a record appears and *what forms of names/titles* are authorized.	6 chapters (21–26) on choice of access points, headings for persons, geographic names, corporate bodies, uniform titles, and making of references.

Part I — Descriptive Rules (Ch. 1–13)

- **Ch. 1:** General rules for books, pamphlets, printed sheets
- **Ch. 2–13:** Special materials
  (Cartographic, Manuscripts, Music, Sound Recordings, Motion Pictures & Video, Graphic materials, Computer files, 3-D objects & realia, Microforms, Serials, Analytic entries)

Part II — Access-Point Rules (Ch. 21–26)

Chapter	Subject	Coverage
21	Choice of access points	Selecting main and added entries
22	Headings for persons	Form and entry of personal names
23	Geographic names	Form and entry of place names
24	Corporate bodies	Choice and form of institutional headings
25	Uniform titles	Establishing standardized title forms
26	References	"See" and "See also" structure between headings

Appendices (A–D)

Appendix	Topic
A	Capitalization
B	Abbreviations
C	Numerals
D	Glossary

At the end: **Index** — guides users to related rules quickly.

34.3 Three Levels of Description

AACR-2R retained the **three-level model** (originating from Cutter's *Rules for a Dictionary Catalogue*) to allow flexibility according to library size and cataloguing purpose.

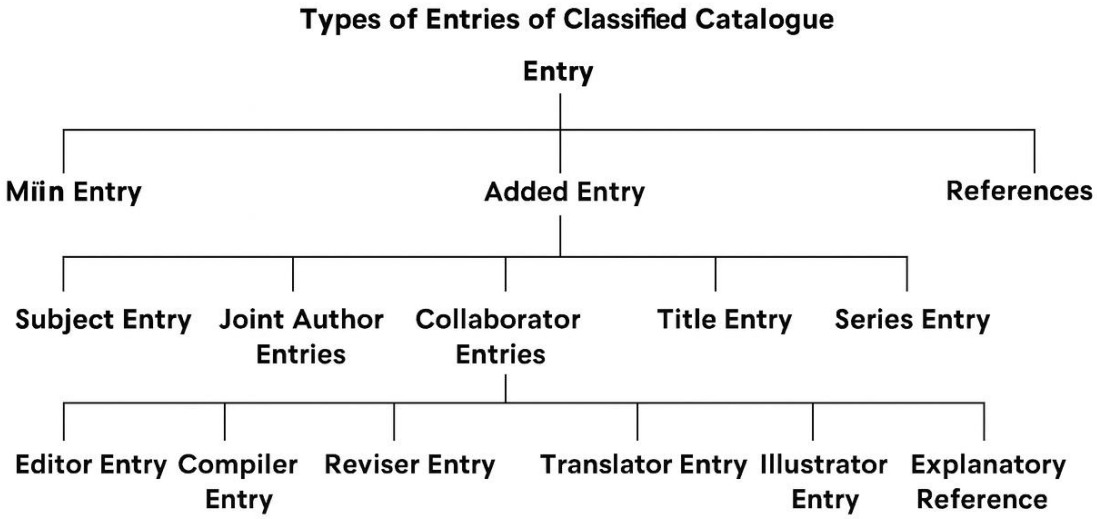
Level	Scope & Use	Schematic Illustration
First Level (Minimal)	For small libraries or brief identification. Includes only essential elements to identify an item.	Title proper / first statement of responsibility (if different from main heading or if none). — Edition statement. — Material-specific details. — First publisher, date. — Extent. — Notes. — Standard number.
Second Level (Standard)	Used by most medium and large libraries; provides standard detail for the main collection.	Title proper [General material designation] = Parallel title : Other title information / First statement of responsibility ; each subsequent statement of responsibility. — Edition statement / Responsibility for edition. — Material-specific details. — Place : Publisher, Date. — Extent : Other physical details ; Dimensions. — (Series title / Responsibility ; ISSN ; Numbering). — Notes. — Standard number.
Third Level (Full)	Exhaustive: includes *every* descriptive element applicable to the item. Used in national bibliographies, archives, and research libraries.	All elements prescribed in AACR-2R. The degree of detail depends on institutional objectives.

In practice: most libraries adopt the **Second Level**, balancing economy and completeness.

34.4 Types of Entries under AACR-2R

AACR-2R recognizes **three categories of catalogue entries**, similar in spirit to the older CCC structure but phrased for the card, OPAC, and MARC environments.

Type of Entry	Purpose / Function
1. Main Entry	The primary access point for the bibliographic record, usually under the personal author, corporate body, or title when no author exists. Contains the *full description*.
2. Added Entries	Secondary access points (additional authors, editors, translators, titles, subjects, series, etc.) to ensure multiple retrieval paths.
3. References	Cross-references (see / see also) that link variant, pseudonymous, or related headings to the authorized form.



Schematic illustration

Main entry

↳ Added entries

↳ References (see / see also)

Together, these form the **network of access points** that make a modern catalogue navigable and machine-searchable.

34.5 Summary of AACR-2R Framework

- **Foundation:** Logical division between **description** (what the item is) and **access** (under whom or what it is found).
- **Scope:** Covers every medium from manuscripts to computer files.
- **Flexibility:** Three levels of description to match different library capacities.
- **Clarity:** Separate chapters for headings, uniform titles, and references.
- **Support:** Appendices standardize capitalization, abbreviations, numerals, and terminology.

AACR-2R thus acts as a bridge between **traditional cataloguing** and **machine-readable standards (MARC, OPAC)**, ensuring both human usability and data consistency.

35. Main Entry of Dictionary Catalogue

The **main entry** is the foundation of a dictionary catalogue — it carries the complete bibliographic description of a document and serves as the **chief access point** from which all added entries and references are derived.

35.1 Definition

Let's see how different cataloguing authorities define *main entry*:

Authority / Code	Definition
Cutter	"The full or principal entry; usually the author entry."
CCC (Ranganathan)	"A specific entry giving maximum information about the whole of a document. All the other entries—specific or general—relating to the document are normally derived from the main entry."
AACR-2R	"The complete catalogue record of an item, presented in the form by which the entry is to be informally identified and cited. The main entry may include the tracings."

Key point:
Only **one main entry** is prepared for each document.
In a **dictionary catalogue**, the *author* (personal or corporate) is given primacy — the main entry is therefore made under the author's name or its substitute (if no author is available).

35.2 Structure of Main Entry (Dictionary Catalogue)

A complete **main entry card** in a dictionary catalogue generally contains **eight sections (data elements)**, all recorded on the front of the catalogue card.
If there is insufficient space, the tracing or continuation is written on the reverse.

Sections of Main Entry Card

No.	Section Name	Purpose / Description
1	**Call Number Section**	Identifies the physical location of the item in the library (Class Number + Book Number).
2	**Heading Section**	Main access point — name of author (personal/corporate), or title if no author.
3	**Title and Imprint Section**	Bibliographic details — title, subtitle, edition, statement of responsibility, place, publisher, and date.
4	**Physical Description & Series Note**	Collation, illustrations, size, and information about the series (if any).
5	**Note Section**	Additional notes about the item (bibliography, illustrations, special features, etc.).
6	**ISBN / ISSN**	International standard number identifying the document.
7	**Accession Number**	Library's internal number for acquisition control.
8	**Tracing**	Record of added entries and subject headings to be prepared.

1. Call Number Section

- Contains the **Class Number** and **Book Number**.
- Written one line above the leading line, one space from the left margin.
- Class number first, then book number (on the leading line).

Example:

155.4

BIT

2. Heading Section

- Records the **main access point** — usually the author's name.
- In personal authorship: *Surname*, comma, *Forename* (e.g., BITHELL, Thomas C.)
- If the heading continues to another line → *hanging indention*: first line starts at first indention, continuation from the third indention.
- For title entries (if no author), start from first indention, continuation from second.

3. Title and Imprint Section

Includes:

- **Title proper**
- **Subtitle** (after colon :)
- **Parallel title** (after equal sign =)
- **Statement of responsibility** (after slash /)
- **Edition statement** (after punctuation .–)
- **Place, Publisher, Year** (separated by punctuation .– and colon, comma as per AACR-2 style).

Example Format:

Title proper : subtitle / statement of responsibility. – Edition. – Place : Publisher, Year.

4. Physical Description and Series Note

- Begins from second indention.
- Gives pagination, illustration details, and book size.
- Series information is recorded in parentheses, preceded by (.–).

Format:

xi, 217 p. : ill. ; 22.4 cm. – (Prentice Hall psychology series; no. XI)

5. Note Section

- Added only when necessary — for multivolume works, special features, bibliographies, etc.
- Begins on a new line (separate paragraph).

Example:

Includes bibliography on pages 211–217. The book is fully illustrated.

6. International Standard Book Number (ISBN)

- Recorded using the abbreviation **ISBN** or **ISSN**, with standard hyphenation and spacing.

Example:

ISBN 897-254-0889

7. Accession Number

- Written in the left margin, generally on the 3rd or 4th line below the leading line.
- No fixed punctuation style, but kept consistent within the catalogue.

Example:

Acc. No. 51291

8. Tracing

- Recorded either on the **front or back** of the card.
- Lists all **added entries** (subject headings, collaborators, title, series, etc.).
- Subject headings numbered in **Arabic numerals (1, 2, 3 …)**.
- Other entries (joint authors, collaborators, series) numbered in **Roman numerals (I, II, III …)**.

Example:

Tracing:

1. Child development

2. Psychology, educational

I. Goldsmith, George

II. Elliot, James, ed.

III. Prentice Hall psychology series

35.3 Example of a Complete Main Entry (Dictionary Catalogue)

Title Page (Given)

Title:
THE TEXT BOOK OF CHILD DEVELOPMENT: Theory & Practice
By **THOMAS C. BITHELL** and **GEORGE GOLDSMITH**
Edited by **James Elliot**
(Third Edition)
London: Prentice Hall Pvt. Ltd., 1987

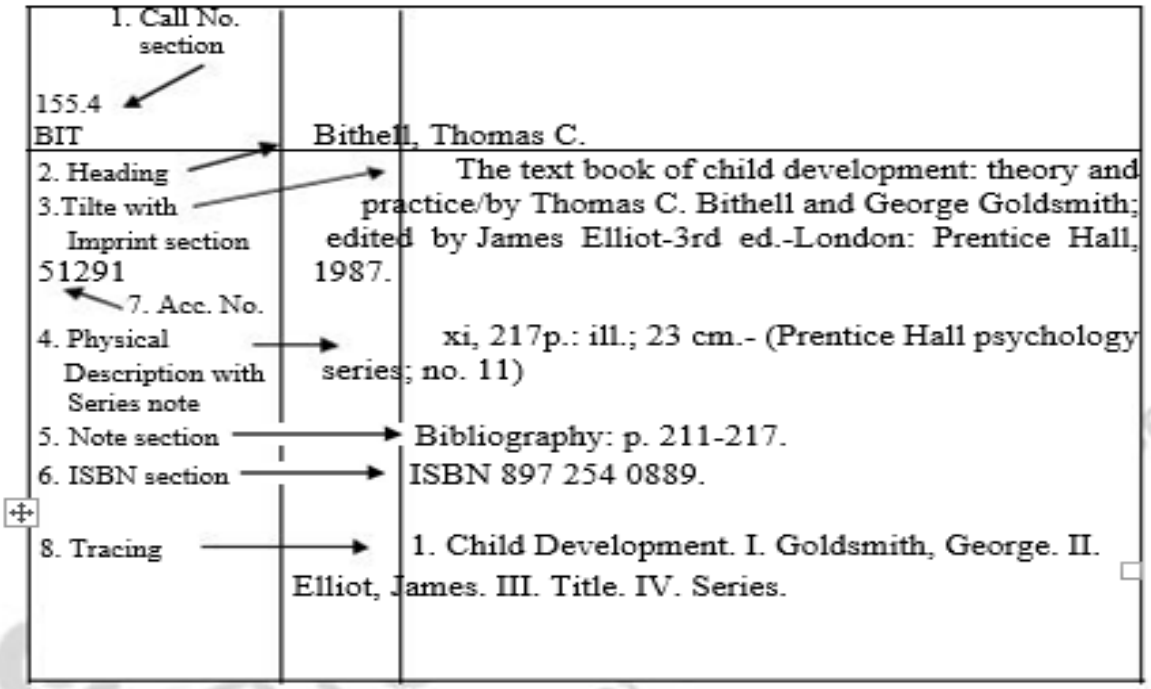
Other Information:

- Call No.: 155.4 BIT
- Acc. No.: 51291
- Pages: xi, 217
- Size: 22.4 cm
- Note: Includes bibliography on pp. 211–217; fully illustrated.
- Series: *Prentice Hall Psychology Series; Number XI.*

- ISBN: 897 254 0889

Main Entry Card (Rendered Example)

Main Entry


1. Call No. section
155.4
BIT
Bithell, Thomas C.
2. Heading
3.Tilte with Imprint section
The text book of child development: theory and practice/by Thomas C. Bithell and George Goldsmith; edited by James Elliot-3rd ed.-London: Prentice Hall, 1987.
51291
7. Acc. No.
4. Physical Description with Series note
xi, 217p.: ill.; 23 cm.- (Prentice Hall psychology series; no. 11)
5. Note section
Bibliography: p. 211-217.
6. ISBN section
ISBN 897 254 0889.
8. Tracing
1. Child Development. I. Goldsmith, George. II. Elliot, James. III. Title. IV. Series.

Source: e-Adhyayan Books

Tracing:

1. Child development

2. Psychology, educational

I. Goldsmith, George

II. Elliot, James, ed.

III. Prentice Hall psychology series

36. Added Entries and References in Dictionary Catalogue

The **added entries** and **references** of a dictionary catalogue expand access to a document beyond its main entry.
They ensure that readers can locate an item through *any significant name, title, or subject* connected with it — a core idea in Cutter's and AACR-2R's philosophy of access.

36.1 Definition of Added Entry

Source	Definition
Cutter	"A secondary entry, i.e. any other than a main entry."
AACR-2R	"An entry, additional to the main entry, by which an item is represented in a catalogue; a secondary entry."

Purpose:
Added entries act as *additional access points* — so a reader can find a book through its **subject**, **joint author**, **collaborator**, **title**, or **series**, even if they don't know the main author.

36.2 Structure of Added Entries

In a **dictionary catalogue**, the **unit card system** is commonly used.

Code / Authority	Definition of Unit Card System
AACR-1	"A basic catalogue card in the form of a main entry which, when duplicated, may be used as a unit for all other entries for that work by adding an appropriate heading."
Ranganathan	"In a unit card system, a copy of the main entry card itself is used for any specific added entry card, merely by inserting in the leading section the heading of the added entry."

So, the **main entry card** is duplicated and the **heading** of the added entry replaces the original heading line.

36.2.1 Subject Entry

Prepared with the help of **Sears List of Subject Headings** or another standard list.
Usually, **up to three subject entries** are made for one document.

Formatting Rule
Subject heading is written **in capital letters**, one line above the leading line, starting from the **second indention**. Continuation (if long) begins from the **third indention**.

Example:

155.4 CHILD DEVELOPMENT.

BIT Bithell, Thomas C.

Rest as main entry

36.2.2 Joint Author Entry

Rule 21.30A1 (AACR-2R):

- Prepare added entries for **up to two joint authors** if the book has two or three authors.
- If **four or more authors**, make an added entry only for the **first named author**, if appropriate.

Example:

155.4 Goldsmith, George

BIT Bithell, Thomas C.

Rest as main entry

36.2.3 Collaborator Entries

AACR-2R recognizes several kinds of collaborators.

6.2.3.1 Editor or Compiler Entry

Rule 21.30B & 21.30D1:

- Prepare added entries for prominently named **editors or compilers**.

- For monographs → always.
- For serials → only when the serial is *known by the editor's name*.

Example:

155.4 Elliot, James

BIT Bithell, Thomas C.

Rest as main entry

6.2.3.2 Translator Entry

Rule 21.30K1:
Make added entry for the **translator** if:

- The translation is in verse; or
- The translation itself has importance; or
- The work has been translated multiple times into the same language; or
- The source implies the translator is effectively the author; or
- The author's name is hard to locate (as in oriental or medieval works).

Example (if applicable):

891.4 Narayan, R.K., tr.

TAG Tagore, Rabindranath.

Rest as main entry

6.2.3.3 Illustrator Entry

Rule 21.30K2:
Added entry under the **illustrator's name** is made when:

- The illustrator's name is given *equal or greater prominence* than the author's.
- Illustrations occupy *half or more* of the item.
- Illustrations are an *important feature* of the work.

Example:

741.6 Sen, Ritu

SHA Sharma, K.K.

Rest as main entry

36.2.4 Title Entry

Rule 21.30J1:
Prepare an added entry under the **title proper** of each item entered under a name (personal, corporate, or uniform title) unless:

- The title proper is essentially the same as the main heading, or
- The title was composed by the cataloguer, or

- The title duplicates an assigned subject heading, or
- A conventional uniform title has been used (for musical works).

Example:

155.4

The textbook of child development.

BIT

Rest as main entry

36.2.5 Series Entry

Rule 21.30L1:
Prepare an added entry under the **series heading** for each separately catalogued item in the series if it helps collocate related items.

Do **not** make a series added entry if:

- The series connects items only by physical characteristics; or
- The numbering is only for stock control or postage convenience.

In doubtful cases → make the series entry.

Example:

155.4 Prentice Hall psychology series; no. 11.

BIT Bithell, Thomas C.

Rest as main entry

36.3 References

36.3.1 Definition

| **AACR-2R Glossary** | "A direction from one heading or entry to another." |

Two principal kinds are recognized:

Type	Rule Reference	Function
See Reference	Rule 26.1B	Directs user from an *unauthorized form* to the *authorized heading*.
See Also Reference	Rule 26.1C	Directs user from one *related* heading to another.
Name-Title Reference	Rule 26.1D	See or see-also reference combining name + title (used when works are entered under author + title form).
Explanatory Reference	Rule 26.E1	Gives explicit guidance when a "see" or "see also" alone might confuse the user.

36.3.2 Structure of References

In a **dictionary catalogue**, both kinds of references are prepared in **two lines**.

(a) See Reference

Purpose: Directs the user from a *non-preferred term* or *variant form* to the *preferred heading*.

Format Example:

LABOUR.

See EMPLOYMENT.

Other Examples:

TWAIN, MARK.

See CLEMENS, Samuel Langhorne.

WATER POLLUTION.

See POLLUTION—WATER.

(b) See Also Reference

Purpose: Directs the user from one heading to another *related heading*.

Format Example:

EDUCATION.

See also TEACHING.

Other Examples:

CHILD DEVELOPMENT.

See also CHILD PSYCHOLOGY.

LIBRARY AUTOMATION.

See also INFORMATION TECHNOLOGY.

37. International Standard Bibliographic Description (ISBD)

37.1 Introduction

In the **Information and Communication Technology (ICT)** era, libraries face an enormous challenge in **locating and retrieving** relevant information efficiently.
To cope with this, bibliographic descriptions must be **standardized and machine-readable**, allowing for **global data exchange, interlibrary cooperation, and universal access**.

A **bibliographic description** is the process of **recording all essential information** about a document so that it can be *identified, located, and accessed instantly*—a core element in information retrieval and dissemination systems.

37.2 ISBD — Concept and Evolution

The **International Standard Bibliographic Description (ISBD)** was developed under the guidance of the **International Federation of Library Associations and Institutions (IFLA)** to standardize bibliographic records worldwide.
It defines **what information to record**, **how to record it**, and **how to punctuate and order it** in a consistent, international manner.

37.2.1 Reasons for the Emergence and Growth of ISBD

The rise of ISBD is rooted in both **technological** and **economic needs** of the global library community.

Main reasons include:

1. The continuing need for **bibliographic standardization** and consistency in cataloguing.
2. **Limited budgets** in libraries made **resource sharing** and cooperative cataloguing essential.
3. The demand for **automation and machine-readable formats** for bibliographic control.
4. To promote **Universal Bibliographic Control (UBC)** — making bibliographic information of all publications globally accessible.
5. ISBD served as a **core component** of IFLA's program for international bibliographic communication.

37.3 Development of ISBD

The origin of ISBD lies in the late 1960s when **IFLA's Working Group on Cataloguing** was established at the **International Meeting of Cataloguing Experts (Copenhagen, 1969)**.

Major Milestones in ISBD Development

Year	Development / Event
1971	Draft ISBD created.
1974	**ISBD(M)** — for monographs — officially published.
Late 1970s–1980s	Specific ISBDs for non-book materials introduced, such as: - ISBD(CM): Cartographic Materials - ISBD(AVM): Audio-Visual Materials - ISBD(CF): Computer Files
1980	**ISBD(G)** issued — provided a *generalized structure* ensuring consistency across all ISBDs.
1990s–2000s	**ISBD(ER)** for Electronic Resources; **ISBD(S)** (Serials) revised as **ISBD(CR)** (Continuing Resources) in 2002.

The ISBD Development Process

The formation or revision of any ISBD typically involves five stages:

1. **Draft creation**
2. **Worldwide review** (circulation to national libraries and cataloguing experts)
3. **Final revision** (based on feedback)
4. **Balloting and approval**
5. **Publication and workshops**

Current Areas of ISBD Discussion

The ISBD Review Group under IFLA periodically examines issues such as:

- Clarification of the **purpose and relationship** between the *Series Area (Area 6)* and *Title Area (Area 1)*.
- Compatibility between **ISBD(CR)** and **ISSN** standards.
- Consistency of **terminology and content** across all ISBD versions.

Feedback collected globally (via IFLANET and professional consultations) helps maintain alignment and interoperability.

37.4 Objectives of ISBD

ISBD revolutionized descriptive cataloguing by introducing **international uniformity** and **machine-readable compatibility**.

Key Objectives

1. To make bibliographic records from different sources **interchangeable** for global networking.
2. To facilitate **interpretation across languages** through consistent punctuation and sequence.
3. To enable **conversion of bibliographic records** into machine-readable form.
4. To promote **international communication** of bibliographic data among diverse linguistic and national communities.
5. To support **varied bibliographic activities** — cataloguing, acquisition, book trade, and bibliographic publication.
6. To enhance the **free flow of information** via standardized data exchange formats.

37.5 Purpose of ISBD

The ISBD framework serves several key purposes that bridge manual and automated cataloguing systems.

Main Purposes

- To **standardize cataloguing rules** and create a **common manual format** for machine-readable records.
- To make publications **identifiable by description alone**—even without reference to headings or uniform titles.
- To **facilitate international exchange** of bibliographic information (both written and electronic).
- To establish a **uniform descriptive framework** applicable to all types of library materials.
- To prescribe **consistent order and punctuation** for bibliographic elements.
- To ensure compatibility with **AACR-2**, which was designed in harmony with ISBD principles.
- To achieve **global bibliographic standardization** for cooperative cataloguing and data sharing.

37.6 Characteristics of ISBD

1. **Comprehensiveness** — Covers every essential element of bibliographic description.
2. **Fixed Order of Data Elements** — Information must appear in a consistent sequence.
3. **Use of Punctuation** — Acts as a *visual and machine-readable delimiter* between elements.
4. **Eight Distinct Areas** — Each group of bibliographic elements is placed in one of the eight defined ISBD areas.

37.7 Scope and Structure of ISBD

ISBD divides bibliographic description into **eight distinct areas**, each separated by prescribed punctuation marks.

These are applicable to **all types of materials**, though certain areas (e.g., Area 3) are specific to cartographic or serial publications.

The Eight Areas of ISBD Description

Area No.	Area Name	Purpose / Content
1	**Title and Statement of Responsibility Area**	Contains title proper, parallel titles, other title information, and statements of responsibility (authors, editors, etc.).
2	**Edition Area**	Details of edition and statements related to revision or version.
3	**Material (or Type of Publication) Specific Details Area**	Used for cartographic, serials, or other special materials to record format-specific information.
4	**Publication, Distribution, etc. Area**	Includes place of publication, publisher, and date.
5	**Physical Description Area**	Provides information on extent (pages, volumes), illustrations, and size.
6	**Series Area**	Title of the series or subseries, statement of responsibility for the series, ISSN, and numbering.
7	**Notes Area**	Additional information not covered elsewhere (e.g., bibliographies, contents notes).
8	**Standard Number and Terms of Availability Area**	Includes ISBN, ISSN, and price or terms of availability.

Example (Illustrative Layout)

1. Title and Statement of Responsibility Area

   The textbook of child development / Thomas C. Bithell and George Goldsmith ; edited by James Elliot.

2. Edition Area

   – 3rd ed.

4. Publication Area

   – London: Prentice Hall Pvt. Ltd., 1987.

5. Physical Description Area

   – xi, 217 p.: ill. ; 22 cm.

6. Series Area

   – (Prentice Hall psychology series ; no. XI)

7. Notes Area

   – Includes bibliography on pages 211–217.

8. Standard Number Area

   – ISBN 897-254-0889.

38. Common Communication Format (CCF)

38.1 Introduction

With the rapid growth of **international bibliographic exchange formats** (such as MARC, UNIMARC, and others), libraries and information centers began facing serious **compatibility issues**. Each organization developed its own local or national standard, which made it difficult to **share records or data efficiently** across borders.

To solve this problem, a **Common Communication Format (CCF)** was developed under the joint initiative of **UNESCO** and **UNISIST**.

The **International Symposium on Bibliographic Exchange Formats** held at **Taormina, Sicily (April 1978)**, organized by the **UNISIST International Centre for Bibliographic Description**, in collaboration with **IFLA**, **ISO**, and the **International Council of Scientific Unions Abstracting Board (ICSU-AB)**, officially initiated this effort.

The goal was simple yet profound —
To create a single, standardized, machine-readable format for the exchange of bibliographic records worldwide.

38.2 Genesis of CCF

Following detailed deliberations, the expert group agreed on a framework for drafting the CCF, with these guiding principles:

1. **Conformity with ISO 2709** — the international standard for bibliographic record structure.
2. **Core Record Concept** — inclusion of a *small number of mandatory data elements* essential for bibliographic description.
3. **Expandability** — addition of *optional data elements* as required.
4. **Linking and Relationships** — standard technique to link related bibliographic entities (e.g., editions, translations, series).
5. **ISBD-based Compatibility** — CCF should serve as a bridge among major bibliographic exchange formats (like MARC, UNIMARC) based on **ISBD principles**.
6. **Hierarchical Record Structure** — to accommodate relationships among records, segments, and fields.

After several refinements, **the first edition of CCF was published in 1984**, followed by **a revised second edition in 1988**, incorporating global feedback and practical experiences from bibliographic agencies across Asia, Europe, and the Americas.

38.3 Rationale

Within any **information system**, bibliographic records may exist in several technical forms to serve distinct purposes:

- **Input format:** For record creation and data entry.
- **Storage format:** Optimized for long-term preservation and internal database organization.
- **Retrieval format:** Designed for quick search and indexing.
- **Display format:** Structured for user presentation (catalogue view, print output, or OPAC).

Hence, a **universal intermediary format** was needed to enable smooth **data transfer** among these different forms — this role was fulfilled by **CCF**.

38.4 Need for CCF

The **need for CCF** emerged from the difficulty of **exchanging records** between organizations using incompatible systems.

Key reasons include:

1. Without a **common standard**, every exchange required custom software or translation programs — inefficient and costly.
2. **National uniformity** was essential — a single national format would simplify information interchange within a country.
3. At the **international level**, standardization of bibliographic formats would facilitate **global data sharing**, avoiding multiple re-cataloguing efforts.
4. CCF aimed to achieve **uniformity and consistency** among agencies producing bibliographic records — libraries, abstracting services, and documentation centers alike.

38.5 Scope of CCF

CCF was designed to provide a **standard bibliographic format** that serves three major purposes:

1. **Exchange of Records** — between libraries, abstracting, and indexing services.
2. **Unified Processing** — enabling an agency to use a single computer program to manipulate records from multiple sources.
3. **Database Foundation** — acting as a reference list of data elements for building or maintaining local bibliographic databases.

Thus, it works as both an **exchange format** and a **working structure** for internal database management.

38.6 Uses of CCF

The design of CCF accommodates a range of bibliographic and information service needs:

1. Specifies **mandatory data elements** (universally essential for item identification).
2. Allows **flexible descriptive practices**, enabling agencies to adapt fields according to their conventions.
3. Provides **optional elements** to enrich bibliographic detail when required.
4. Offers **mechanisms for linking related records** (e.g., parent-child, series, or continuation relationships) without enforcing a rigid structure.

Essentially, CCF balances **standardization with flexibility**, allowing it to function across diverse bibliographic environments.

38.7 Structure of CCF

The **CCF record structure** is a specific implementation of **ISO 2709**, the international standard for machine-readable bibliographic records.

Each **CCF record** consists of **four major parts**:

Part	Component	Function
A. Record Label	Fixed length (24 characters) header	Provides basic parameters for record processing (e.g., record length, status, type).
B. Directory	Variable-length table	Lists each data field's tag, length, position, and identifiers.
C. Data Fields	Variable-length fields	Contain actual bibliographic information, divided into indicators and subfields.
D. Record Separator	Final control character	Marks the end of the record, enabling proper parsing during data exchange.

(A) Record Label

- Always **24 characters long**.
- Serves as the *control section* of a CCF record.
- Contains coded data specifying record length, type, status, implementation level, and entry map.

(B) Directory

- Functions as the **table of contents** for the record.
- Each **directory entry** corresponds to one data field and contains:
    1. **Tag** – identifies the field (e.g., 100 for author).
    2. **Length of data field** – number of characters in that field.
    3. **Starting character position** – location of the field within the record.
    4. **Segment identifier** – identifies the logical segment to which the field belongs.
    5. **Occurrence identifier** – distinguishes repeated instances of a field.
- The directory ends with a **field separator** character.

(C) Data Fields

Each **data field** may consist of:

1. **Indicators** – provide additional coded information about the field.
2. **Subfields** – individual data elements, each preceded by a *subfield identifier* (e.g., $a, $b, $c).
3. **Field separator** – marks the end of the data field.

Example (illustrative):

100 ##$a Bithell, Thomas C.$d 1905-

245 10$a The text book of child development /$c Thomas C. Bithell and George Goldsmith.

260 ##$a London :$b Prentice Hall Pvt. Ltd.,$c 1987.

(D) Record Separator

- The **record separator** (Character 1/13 of ISO 646) appears **after the last field separator**.
- It signals the **end of the record**, ensuring accurate reading and processing.

38.8 Features of CCF

CCF's flexibility and universality have led to its adoption by numerous institutions and national bibliographic agencies worldwide.
Some of its **notable features** include:

1. **Comprehensive Data Elements** – allows complete bibliographic description suitable for cataloguing and database creation.
2. **No Cataloguing Code Restriction** – CCF itself does not impose cataloguing rules (e.g., AACR2, ISBD) but is *compatible with all*.
3. **User and System Friendly** – easily adaptable and implementable across systems.
4. **Flexible for Developing Nations** – widely adopted for creating machine-readable bibliographies at low cost.
5. **Compatible with AACR2** – records following AACR2 standards can be conveniently converted into CCF format.
6. **Incorporation of Optional and Private Fields** – agencies can define local elements as needed.
7. **Uniform Computer Processing** – enables use of a single program for handling diverse data sources.
8. **Support for Varying Descriptive Practices** – accommodates both minimal and detailed cataloguing levels.
9. **Logically Defined Structure** – uses ISO 2709's directory element to manage bibliographic levels and field occurrences.
10. **Retrieval-Oriented Design** – intended for efficient searching and display within library or institutional systems.

39. Functional Requirements for Bibliographic Records (FRBR) — short notes (topic-wise)

Keeping the numbering continuous. Short, topic-wise notes with **always 6 examples** and tables where useful.

39.1 Introduction

FRBR is a conceptual (entity–relationship) model that structures bibliographic information around **user tasks**: **Find, Identify, Select, Obtain**. It defines entities (what bibliographic records describe), their attributes (properties) and relationships (links), so systems can support users' needs more directly.

39.2 Background (why FRBR) — key points

- Born from cataloguing needs after ICCP (1961), IMCE (1969) and ISBD development.
- Triggered by automation, shared cataloguing, new electronic publishing, budget pressures.
- IFLA Study Group produced FRBR (published 1998).
- Method: **Entity–Relationship (E-R) model** (P. P. Chen).

6 quick context examples

1. Shared national bibliographic utilities (e.g., national union catalogue).
2. Large online bibliographic databases (e.g., OCLC).

3. Multiple editions of textbooks causing confusion.
4. Electronic resources with different access modes (remote vs. local).
5. Libraries doing "minimal level" cataloguing for costs.
6. Need for better user-centric OPAC discovery (distinguish work vs edition).

39.3 Entities — overview table (Group, definition, 6 examples each)

Group 1 — Work / Expression / Manifestation / Item

Entity	Short definition	6 examples
Work	Abstract intellectual/authistic creation	1. *Hamlet* (Shakespeare) 2. Gray's *Anatomy* 3. Beethoven's Ninth 4. *Iliad* 5. *Linux Kernel* (conceptual work) 6. *Oxford English Dictionary* (as concept)
Expression	Realization of a Work (text, translation, edition)	1. English translation of *Iliad* 2. 3rd edition revised text of Gray 3. Musical score of Beethoven's Ninth 4. Recorded performance A 5. Critical edition with commentary 6. Braille rendering
Manifestation	Physical/technical embodiment of an Expression	1. 1964 Van Nostrand paperback 2. 1972 Dover reprint 3. 2-CD audio set of a performance 4. Hardcover illustrated edition 5. PDF e-book file 6. Microfilm copy
Item	A single exemplar / copy of a Manifestation	1. Copy #3 in Library stacks 2. Autographed copy 3. Library reserve copy 4. Personal owner's copy 5. Special binding presentation copy 6. Numbered limited edition copy

Group 2 — Person / Corporate body

Entity	Definition	6 examples
Person	Individual responsible for creation/realization	1. Margaret Atwood 2. Rabindranath Tagore 3. Thomas Bithell 4. Wendy Gill (translator) 5. J. K. Rowling 6. A conference keynote speaker
Corporate body	Organization or group identified by name	1. BBC Symphony Orchestra 2. Museum of Modern Art 3. SAARC 4. International Labour Organization 5. IEEE 6. University of Delhi

Group 3 — Concept / Object / Event / Place

Entity	Definition	6 examples
Concept	Abstract notion or topic	1. Cognitive science 2. Romanticism 3. Democracy 4. Quantum mechanics 5. Environmental ethics 6. Supply chain management
Object	Material thing as subject	1. Taj Mahal 2. Apollo 11 3. Buckingham Palace 4. Ming vase 5. Model T Ford 6. The Eiffel Tower
Event	Action or historical occurrence	1. World War II 2. Indian Independence (1947) 3. 2008 Global Financial Crisis 4. The Garment Workers' Strike 5. Apollo 11 landing 6. The Renaissance
Place	Location, geographic / jurisdictional	1. New Delhi 2. Himalayas 3. Alacran Reef 4. Howard Beach 5. Kolkata 6. Atlantic Ocean

39.4 Attributes — what each entity carries

*(FRBR defines many; below are **6 principal attributes** per major entity for quick use.)*

Work — 6 principal attributes

1. Title of the work
2. Form of work (e.g., novel, symphony)
3. Date of the work (composition/creation)
4. Intended audience (children, specialists)
5. Context for the work (series, program)
6. Other distinguishing characteristics

Expression — 6 principal attributes

1. Title of the expression
2. Form of expression (translation, revision)
3. Date of expression (year of translation/revision)
4. Language of expression
5. Extent (e.g., number of pages, duration)
6. Summarization/abstract of content

Manifestation — 6 principal attributes

1. Edition/issue designation
2. Place & date of publication/distribution
3. Publisher/distributor
4. Physical carrier form (print, CD, online)
5. Series statement (if any)
6. Manifestation identifier (ISBN/ISSN)

Item — 6 principal attributes

1. Item identifier (barcode)
2. Provenance (ownership history)
3. Marks/inscriptions (ex libris, autographs)
4. Condition of item
5. Exhibition/treatment history
6. Access restrictions (e.g., fragile, special reading room)

Person — 6 principal attributes

1. Name (authorized form)
2. Dates (birth/death)
3. Title/role (editor, composer)
4. Affiliation (institutional link)

5. Other designation (honorifics)
6. Identifiers (ISNI, VIAF)

Corporate body — 6 principal attributes

1. Authorized name
2. Number associated (e.g., department number)
3. Place associated (headquarters)
4. Date associated (founding)
5. Other designation (abbreviations)
6. Identifiers (ROR, ISNI)

*(For Concept / Object / Event / Place — the key attribute often is a controlled **term** or name; provide 6 topical terms as examples in prior table.)*

39.5 Relationships — types & 6 illustrative examples

Relationships connect entities so users can traverse bibliographic space.

Major relationship types

1. Work ↔ Expression (a work has translations; a translation realizes a work)
2. Expression ↔ Manifestation (an expression is embodied in a particular edition/file)
3. Manifestation ↔ Item (a manifestation is exemplified by physical copies)
4. Work/Expression ↔ Person/Corporate (author, editor, translator, producer)
5. Work ↔ Work (adaptation, commentary, sequel)
6. Subject relationships (work about a concept, place, object, event)

6 concrete relationship examples

1. *Iliad* (Work) → English translation by A (Expression).
2. Translation (Expression) → 2001 Penguin paperback (Manifestation).
3. Penguin paperback (Manifestation) → copy #7 in Library (Item).
4. Beethoven's Ninth (Work) → conductor X performance (Expression → Manifestation = recording).
5. *Pride and Prejudice* (Work) → film adaptation (*work-to-work* relationship).
6. Biography of Nelson Mandela (Work) → subject relationship → Event: "Anti-apartheid struggle".

39.6 User Tasks — FRBR's four tasks with 6 example queries each (so designers see what to support)

Task: Find — locate entities matching criteria

Examples (queries users might make):

1. Find all works titled *Hamlet*.
2. Find editions of *Gray's Anatomy* in English.
3. Find all translations of *Iliad* into Hindi.

4. Find manifestations (paperback) of a given expression.
5. Find items (available copies) in my library.
6. Find recordings (manifestations) of a specific concerto.

Task: Identify — confirm a match / disambiguate

Examples:

1. Is this *Hamlet* the Arden edition?
2. Which *Anatomy* is the student edition?
3. Which translation of *Iliad* was done by X?
4. Is this manifestation the 3rd edition published 1995?
5. Which recording is by conductor Y (1992)?
6. Which author "J. Smith" wrote the work I need?

Task: Select — choose the appropriate version/format

Examples:

1. Choose a recent edition with updated commentary.
2. Choose an online accessible manifestation vs. print.
3. Choose a translation suitable for students (simplified language).
4. Select color-illustrated vs. monochrome edition.
5. Select authoritative scholarly edition.
6. Choose the copy in good condition for reproduction.

Task: Obtain — access or acquire the item

Examples:

1. Request interlibrary loan for Manifestation X.
2. Download the e-book (manifestation available online).
3. Place hold on Item #12 (checked out).
4. Purchase rights to a manifestation for course reserves.
5. Get access address (URL) for remote manifestation.
6. Reserve special reading room access for a rare item.

39.7 FRBR in practice — 6 implementation examples / systems

1. OCLC FictionFinder — groups works/expressions for fiction discovery.
2. RedLightGreen — prototype public catalog using FRBR grouping.
3. Virtua ILS — FRBR-aware discovery modules.
4. BIBSYS (Norway) — FRBRized union catalogue.

5. National bibliographies mapping works→editions→copies.
6. RDA (Resource Description & Access) — cataloguing code adopting FRBR concepts.

39.8 Conclusion — key takeaways (short)

- FRBR reorganizes bibliographic thinking from **records** to **entities, attributes, relationships** focused on user tasks.
- It improves discovery by **grouping expressions and manifestations under the abstract work**, reducing duplication and confusion.
- FRBR underpins modern standards (RDA) and FRBR-aware discovery enhances user workflows: find → identify → select → obtain.

40. Resource Description & Access (RDA) — short notes (topic-wise)

Continuing numbering. Short, clear topic notes with **always 6 examples** and tables where helpful.

40.1 Introduction

RDA is the successor to AACR2. It's a modern standard for bibliographic description that:

- Describes all resource types (analog & digital).
- Produces data adaptable to new database models.
- Keeps compatibility with existing online catalogue records.

6 example uses of RDA-produced data

1. Describing an e-book for a library catalogue.
2. Creating machine-readable records for institutional repositories.
3. Recording a multimedia kit (video + print).
4. Preparing metadata for streaming audio.
5. Encoding archival finding aids for discovery.
6. Exporting bibliographic records to union catalogues.

40.2 History (concise timeline)

- 1997 Toronto conference: AACR reconsidered (FRBR, content vs carrier, seriality).
- JSC initially planned AACR3; feedback led to rethinking.
- 2005: new title adopted — **RDA (Resource Description & Access)** — designed for the digital environment and FRBR principles.

6 historical milestones

1. AACR2 publication (1978).
2. ICCP / Toronto conference (1997).
3. Draft AACR3 (early 2000s) and public response.
4. Decision to create RDA (2005).
5. Integration of FRBR/FRAD concepts into RDA design.

6. RDA's adoption and alignment with library automation systems.

40.3 Purpose & scope

RDA supplies guidelines to create metadata that supports discovery and access by users performing FRBR-based tasks (Find, Identify, Select, Obtain). It also supports authority data tasks (Find, Identify, Clarify, Understand).

6 scope highlights

1. Describing works, expressions, manifestations, items.
2. Describing agents (persons, families, corporate bodies).
3. Handling concepts/objects/events/places as subjects.
4. Supporting both human display and machine processing.
5. Supporting international sharing and interoperability.
6. Applying to all carrier and content types (print, digital, multimedia).

40.4 Underlying principles — (brief)

40.4.1 FRBR

RDA uses FRBR terminology and structure: WEMI (Work, Expression, Manifestation, Item); FRBR user tasks determine mandatory data.

6 FRBR influences on RDA

1. Separate data for Work vs Expression vs Manifestation.
2. Mandatory elements chosen to support Find/Identify/Select/Obtain.
3. Explicit recording of relationships (e.g., translation of a work).
4. Attributes mapped to RDA data elements.
5. Grouping manifestations under a single work for cleaner displays.
6. Enabling cross-resource navigation in discovery interfaces.

40.4.2 FRAD

FRAD structures authority data supports authority control, international sharing, and user tasks about entities.

6 FRAD influences on RDA

1. Authority elements for persons and corporate bodies.
2. Support for variant names and identifiers.
3. Emphasis on contextual data (dates, roles, qualifiers).
4. Designed to aid disambiguation (identify).
5. Facilitation of record exchange across borders.
6. Basis for relationship designators in RDA.

40.4.3 Statement of International Cataloguing Principles (ICP)

RDA aligns with ICP goals: catalogue enabling find/identify/select/obtain and navigation across bibliographic universe.

6 ICP objectives reflected in RDA

1. Find resources by attributes/relationships.
2. Identify and distinguish similar resources.
3. Select appropriate resources by format/content.
4. Obtain or access the resource.
5. Present clear navigational relationships among entities.
6. Support multilingual and international cataloguing practice.

40.5 Structure of RDA — overview table

Part	What it covers	Representative chapters / elements	6 quick examples of application
Sections 1–4	Attributes to describe FRBR entities	Ch.1–4 (manifestation/item), Ch.5–7 (work/expression), Ch.8–11 (person/family/corp), Ch.12–16 (concept/object/event/place)	1. Recording ISBN (manifestation) 2. Title proper of a work 3. Language of expression 4. Author name form (person) 5. Place of publication 6. Subject term (concept)
Sections 5–10	Relationships among entities	Ch.17–28 (primary & inter-group relationships), Ch.29–37 (agent & subject relationships)	1. Link translation (expression → expression) 2. Link edition to work 3. Link author to manifestation as contributor 4. Link related works (adaptation) 5. Link corporate parent/child 6. Link place as subject
Appendices	Technical aids & designators	A–M (capitalization, abbreviations, relationship designators, syntaxes)	1. Relationship designator “translator” 2. Capitalization rules 3. Abbrev. list 4. Date conversion 5. Record syntax examples 6. Titles of nobility handling

(RDA: 10 sections, 37 chapters, 12 appendices + glossary & index.)

40.6 Sections — quick map and 6 examples per major section group

Section 1 — Manifestation & Item (Ch.1–4)

Focus: identifying manifestations/items, carriers, acquisition/access data.

6 examples of data elements in this section

1. Manifestation title proper.
2. Edition/issue statement.
3. Carrier type (online resource, audio disc).

4. Extent (pages, duration).
5. Manufacturer/fabricator (for artifacts).
6. Access conditions / availability.

Section 2 — Work & Expression (Ch.5–7)

Focus: attributes that define abstract content and its realizations.

6 examples

1. Title of the work (preferred).
2. Form of work (novel, symphony).
3. Language of expression.
4. Date of expression (year of composition/translation).
5. Mode of performance (musical works).
6. Numeric designation (e.g., Opus number).

Section 3 — Persons, Families, Corporate Bodies (Ch.8–11)

Focus: authority data and identification of agents.

6 examples

1. Authorized name for a person.
2. Dates associated with a person (b.-d.).
3. Corporate body preferred name.
4. Family name and qualifiers.
5. Role designator (editor, illustrator).
6. Identifiers (ISNI, ORCID).

Section 4 — Concepts/Objects/Events/Places (Ch.12–16)

Focus: attributes and identifiers for subjects (some chapters developed later).

6 examples

1. Preferred term for a concept (e.g., “Cognitive science”).
2. Object name used as subject (e.g., “Taj Mahal”).
3. Event label (e.g., “World War II”).
4. Place name variants and coordinates.
5. Temporal coverage for events.
6. Subject identifiers (e.g., GeoNames ID).

Sections 5–10 — Relationships (Ch.17–37)

Focus: recording primary relationships (W→E→M→I), agent relationships, related works, subject relationships, and entity-to-entity relations.

6 examples of relationships RDA records

1. “is translation of” (expression→work).
2. “is embodiment of” (manifestation→expression).
3. “has contributor” (work→person: editor).
4. “is adaptation of” (work→work).
5. “is related to” (manifestation→manifestation: reissue).
6. “is subject of” (concept→work).

40.7 Appendices — purpose & 6 notable ones

RDA appendices supply operational rules and relationship designators.

6 notable appendices

1. Appendix A — Capitalization rules.
2. Appendix B — Abbreviations.
3. Appendix C — Initial articles handling.
4. Appendix D/E — Record syntaxes (descriptive & access point data).
5. Appendix J/K/L/M — Relationship designators (agents → resources → concepts → works).
6. Appendix H — Gregorian date conversion.

40.8 RDA behaviour & benefits — 6 practical outcomes

1. Metadata ready for linked-data and web publishing.
2. Easier grouping of records by Work/Expression for user displays.
3. Clearer authority control using FRAD concepts.
4. Improved interoperability across systems (formats & cultures).
5. Better support for non-print and digital resources.
6. Relationship designators improve navigability between entities.

40.9 Quick comparison: AACR2 vs RDA (table)

Aspect	AACR2	RDA
Foundational model	Rules oriented to cards and print era	FRBR/FRAD conceptual model (entity-relationship)
Resource types	Strong on traditional print; weaker on digital	Designed for all content/carrier types
Focus	Description rules; headings as primary	Data elements + explicit relationships
Machine-friendliness	Limited (card legacy)	Designed for machine processing & linked data
Authority control	Separate traditional guidance	Integrated with FRAD and relationship designators
Flexibility	Rigid in some areas	Flexible, extensible for new media

41. RDA — structure (detailed) and worked example

Keeping the numbering rolling. Short, tidy recap of the RDA structure you posted plus a compact table that maps the RDA elements from your example to MARC21 fields (so the two views sit side-by-side).

41.1 Quick recap — RDA contents (one-line each)

1. **10 Sections** (Sections 1–10) — attributes & relationships for FRBR entities.
2. **37 Chapters** — specific guidance (e.g., Ch.1–4 manifestations/items; Ch.5–7 works/expressions; Ch.8–11 agents; Ch.12–16 subjects; Ch.17–28 primary/related relationships; Ch.29–37 agent relationships & related entities).
3. **12 Appendices** — A–M (capitalization, abbreviations, initial articles, record syntaxes, relationship designators, etc.).
4. **Glossary & Index**.

41.2 Example (printed book) — condensed mapping

Below is a focused table mapping the RDA elements from your example to the MARC21 fields shown. I kept the fields you supplied and matched the principal RDA element to the MARC tag used in the example.

RDA ref / element	Data recorded (example)	MARC21 field (example)
2.3.2 Title proper	*The organization of information*	245 $a The organization of information /
2.4.2 Statement of responsibility	Arlene G. Taylor	245 $c Arlene G. Taylor.
2.5.2 Designation of edition	Second edition	250 $a Second edition.
2.8.2 Place of publication	Westport, Connecticut ; London	264 #1 $a Westport, Connecticut ; $a London :
2.8.4 Publisher's name	Libraries Unlimited, a member of the Greenwood Publishing Group	264 #1 $b Libraries Unlimited, a member of the Greenwood Publishing Group,
2.8.6 Date of publication	2004	264 #1 $c 2004.
2.12.2 Series title	Library and information science text series	490 $a Library and information science text series ; 830 $a Library and information science text series.
2.13 Mode of issuance	single unit	(no single dedicated MARC tag in basic record; implicit in leader/007/008)
2.15 Identifier for manifestation (ISBN)	1563089769 ; 1563089696	020 $a 1563089769 ; 020 $a 1563089696
3.2 Media type	unmediated	337 $a unmediated $2 rdamedia
3.3 Carrier type	volume	338 $a volume $2 rdacarrier
3.4 Extent	xxvii, 417 pages	300 $a xxvii, 417 pages ; $c 26 cm.
3.5 Dimensions	26 cm	300 $c 26 cm.
4.3 Contact information (URL)	http://www.lu.com	037 $b http://www.lu.com (source/acquisition)
6.9 Content type	text	336 $a text $2 rdacontent

7.16 Supplementary content	Includes bibliography and index	504 $a Includes bibliography and index.
17.8 Work manifested	Taylor, Arlene G., Organization of information	700/700/830 (related entries / series); Work mapping is conceptual (not always separate MARC field)
19.2 Creator (person)	Taylor, Arlene G., 1941-	100 $a Taylor, Arlene G., $d 1941- $e author
18.5 Relationship designator	author	100 $e author (subfield $e is the relator term)

Note: RDA elements sometimes map to multiple MARC fields or to a combination of leader/008/007 plus explicit 3xx/6xx/7xx fields. Some RDA elements (like a Work URI or structured relationships) are represented in MARC using combination of fields (e.g., 7xx linking entries, relator terms, URIs in $0/$1/$0 subfields) or in non-MARC syntaxes (MARCXML, BIBFRAME, RDF).

41.3 Core (mandatory) elements shown in your example

RDA marks some elements as *core* (needed to support FRBR user tasks). In your example the primary core elements include (shaded in the original):

- Title proper (2.3.2)
- Statement of responsibility relating to title (2.4.2) — when applicable
- Place, publisher name, date of publication (2.8.2/2.8.4/2.8.6)
- Identifier for the manifestation (ISBN) (2.15)
- Extent (3.4)
- Media/carrier type (3.2/3.3)
- Content type (6.9)

(Implementations may add or remove core elements depending on local policy and the user tasks prioritized.)

41.4 Practical notes — what to watch for

- **RDA ≠ MARC**: RDA defines *what* data; MARC (or other syntaxes) defines *how* to encode it. Modern practice maps RDA elements to MARC21, MARCXML, BIBFRAME or other linked data models.
- **Relationship designators** (appendices J–M) should be used in $e or $4 (and in linked data as typed relationships) to make roles explicit.
- **Series handling**: RDA's series data go into 490/830 in MARC; RDA allows recording series as works related to the manifestation.
- **Identifiers**: include ISBN/ISSN and where possible authority identifiers (ISNI, ORCID) mapped to $0 (URI) or $0/$1 depending on local practice.

Unit. 3. Methods of Knowledge Organization

45. Library Classification Systems

Library classification is the process of organizing knowledge systematically so that documents can be easily located, accessed, and related to one another. It is both an intellectual and a mechanical process designed to reflect the universe of knowledge as recorded in documents. Since the late 19th century, several classification systems have emerged to serve this purpose.

Major General Library Classification Systems:

- **Dewey Decimal Classification (DDC, 1876–)** — by *Melvil Dewey*
- **Universal Decimal Classification (UDC, 1905–)** — by *FID (now UDCC)*
- **Expansive Classification (EC, 1892)** — by *C.A. Cutter*
- **Library of Congress Classification (LCC, 1904–)**
- **Subject Classification (SC, 1906–1939)** — by *J.D. Brown*
- **Bibliographic Classification (BC, 1940–1953)** — by *H.E. Bliss*
- **Colon Classification (CC, 1933–1987)** — by *S.R. Ranganathan*
- **Bibliothecal Bibliographical Klassification (BBK, 1960–1970)** — by *VINITI, Russia*
- **Rider's International Classification (RIC, 1961)** — by *Fremont A. Rider*
- **Information Coding Classification (ICC, 1970)** — by *I. Dahlberg*
- **Bliss Bibliographic Classification, 2nd Edition (BC–2, 1977–)** — by *J. Mills*
- **Broad System of Ordering (BSO, 1978)** — by *Eric Coates*

Among these, **DDC**, **UDC**, and **LCC** are known as the "Big Three" systems. **CC** and **BC–2** are admired for their scientific and logical structures. **BSO** and **ICC** are not used for shelving documents but rather for information organization.

46. Qualities of a Good Library Classification System

A sound classification system should:

1. Bring together closely related subjects.
2. Allow detailed subdivision for all possible topics.
3. Be flexible for future extensions.
4. Avoid frequent or drastic revisions.
5. Be widely recognized and easy for users to navigate.
6. Contain an extensive alphabetical index.
7. Use a clear and mixed notation showing hierarchy and flexibility.
8. Be available in online or web-based format.

47. Functions of a Library Classification System

A good system performs three main functions:

1. **Cognitive Function (Mapping Knowledge):**
    - Provides a structured overview of knowledge.
    - Example: DDC divides the entire field of knowledge into ten main classes.
2. **Bibliographic Function (Information Retrieval):**
    - Enables retrieval of related documents efficiently.
    - Example: Searching for "Climate Change" retrieves documents under "551.6" in DDC.
3. **Shelf Arrangement (Location and Browsing):**
    - Guides physical and digital organization of documents.
    - Example: Books on related topics are placed near each other on shelves or in databases.

The system's logical arrangement supports random access, meaningful browsing, and associative linking between topics.

48. Functional Requirements of Bibliographic Classification

A classification should:

1. **Link Items and Catalogue Entries:**
    - The class number forms part of the *call number* for easy identification and retrieval.
    - Example: A book with class number 320.5 (Political Theory) is shelved accordingly.
2. **Enable Direct Browsing:**
    - Users can locate materials on a topic and related subjects nearby.
    - Example: "Education" and "Teacher Training" books appear adjacent.

The sequence should reflect relationships and group likely subjects together for better user experience.

49. Essential Features of a Library Classification System

It must be:

- **Explicit and well-documented** with clear notes.
- **Accessible** to both users and classifiers.
- **Cognitively aligned** with users' understanding.
- **Based on literary warrant**—that is, grounded in the actual body of published literature.

50. Print and Machine-Readable Formats

Modern classification systems exist in both print and digital formats. Systems like **DDC**, **UDC**, and **LCC** are now maintained mainly as machine-readable databases (often using *MARC-21 Concise Format*).

Functions of Machine-Readable Classifications:

- Search by notation or keywords.
- Explore hierarchical relations among subjects.
- View schedules in multiple layouts.

- Navigate between tables, facets, and related areas.
- Trace historical data and replaced classes.
- Export data for cataloguing systems.

Even though their medium differs, the intellectual structure remains consistent with the print versions.

51. General vs. Special Classification

- **General Classification:** Covers the entire universe of knowledge.
    - Examples: DDC, UDC, LCC, BC–2.
- **Special Classification:** Designed for a specific subject, collection, or document type.
    - Examples: Classification for medical libraries, fiction, or maps.

Some general schemes, like **UDC** or **BC–2**, can be adapted for special collections due to their detailed structure.

52. Parts of a Library Classification System

A complete classification system includes three main components (Rowley and Hartley):

1. **Schedules:**
    - The structured list of subjects arranged in a logical order.
    - Example: DDC's ten main classes (000–900).
2. **Notation:**
    - Alphanumeric codes that represent subjects and guide arrangement.
    - Example: "510" for Mathematics.
3. **Alphabetical Index:**
    - Lists terms alphabetically to help locate their class numbers.
    - Example: "Botany → 580."

53. Schedules

A **schedule** is the central structure of any classification system — a systematically arranged list of subjects and their subdivisions. It represents the intellectual map of knowledge within a scheme and determines how topics are ordered and interrelated.

Elements of Classification Schedules:

- **Main Classes** — broad divisions of knowledge.
- **Division of Classes** — successive subdivisions under each main class.
- **Facets** — categories generated through facet analysis.
- **Sub-facets (Arrays)** — subdivisions within a facet based on a single characteristic.

53.1. Example:
As explained by *Aida Slavic (2008)*, an entry from the online **UDC schedules** contains several data components:

Example entries:
004.421.2 — Basic mathematical algorithms
004.421.2:517.443 — Fast Fourier Transform
004.421.2:517.535 — Algorithms for rational expressions
004.421.2:519.17 — Graph algorithms

Each entry, when stored in a database, includes **seven data blocks:**

1. **Notation** (classification number and structural components)
2. **Broader Class**
3. **Caption**
4. **Notes** (scope, application, combination rules, editorial notes, etc.)
5. **References** (see also links)
6. **Class ID** (unique identifier)
7. **Index Terms** (keywords for search)

These blocks together make the classification system rich, searchable, and computationally usable.

54. Division of Classes

The division of classes should always occur **by one characteristic at a time** to maintain clarity and logical sequence. Two main approaches exist:

a. Enumerative Approach:

- Divides classes in a top-down, funnel-like manner.
- Covers hierarchical relations but risks redundancy.
- Often leads to over-subdivision without literary warrant.
- Example: DDC's long enumerations of topics under science or history.

b. Faceted Approach:

- Built bottom-up by combining basic concepts from predetermined facets.
- Encourages synthesis of new subjects.
- Adapts easily to emerging disciplines.
- Example: Ranganathan's Colon Classification and BC–2 (Bliss).

Faceted systems are dynamic, flexible, and logically transparent — far better suited for the digital information age.

55. Relations in Library Classification

Classification is essentially a network of **relations** — between subjects, concepts, and notations. Two key types exist:

55.1. Semantic Relations:
These show **meaning-based relationships** between subjects.

- **Hierarchical:** Broader–narrower relations (e.g., Biology → Zoology → Ornithology).

- **Cognate:** Subjects that are conceptually close (e.g., Physics and Chemistry).
- **Collocative:** Subjects grouped for user convenience (e.g., Literature and Criticism).
- **Filial:** Sequential relations such as cause-effect or evolution.

Ranganathan proposed **eight principles of helpful sequence**, including chronological, geographical, evolutionary, and conventional arrangements.

55.2. Syntactic Relations:
These express **grammatical or structural relationships** among facets.

- Governed by **citation order**, as per Ranganathan's **PMEST** formula:
    - Personality → Matter → Energy → Space → Time.
- The **Wall-Picture Principle** (dependency) and **Cow-Calf Principle** (logical sequence) help arrange facets meaningfully.
- BC–2 (Bliss Classification) expanded this into a broader formula:
  Thing–Kind–Part–Property–Material–Process–Operation–Patient–Product–Byproduct–Agent–Space–Time.

55.3. Principle of Inversion:

- The *citation order* (specific → general) differs from *shelf order* (general → specific).
- Systems like **UDC** achieve this by reversing auxiliary facets (Tables 1a–1k used in inverse order).
- Ensures logical browsing and coherent physical arrangement.

56. Main Classes

Main classes represent the first major divisions of knowledge in a classification scheme, generally organized by **discipline**.

- DDC: 10 main classes
- LCC: 24 main classes
- CC–7: Over 700 main classes

These are conventionally structured and somewhat arbitrary but provide the backbone for all subdivisions.

56.1. Generalia Class:
The **Generalia Class** houses works that cover multiple subjects or general knowledge — encyclopedias, newspapers, or works not belonging to one field.

Example (DDC Outline of Class 000):
000 – Knowledge & Systems
010 – Bibliographies
020 – Library & Information Science
030 – Encyclopedias
050 – Magazines, Journals & Serials
060 – Associations, Organizations & Museums
070 – Journalism & Publishing
080 – Quotations
090 – Manuscripts & Rare Books

It functions as both a **form** and **general subject class**, providing a home for polytopical works.

57. Form Divisions

A subject may be treated in many forms — as a dictionary, journal, or history. These are known as **form divisions** or **common subdivisions**.
In **DDC**, such form divisions are found in **Table–1**, for example:

- –01 Theory & Philosophy
- –02 Handbooks
- –03 Dictionaries and Encyclopedias
- –05 Serials
- –06 Conference Proceedings
- –07 Study and Teaching
- –08 Anthologies
- –09 History, Biography, etc.

These can be added to any class number to indicate the document's form, not its subject.

58. Form vs. Subject

The **form** of a document refers to *how* it presents knowledge (e.g., as an encyclopedia or handbook), whereas **subject** refers to *what* the book is about.

Example:

- *Encyclopedia Britannica* → Class No. **032** (Encyclopedia as form).
- *Book on History of India* → Class No. **954** (India's history as subject).

Form divisions refine shelf arrangement by grouping materials not only by topic but also by presentation type.

59. Devices for Synthesis and Phase Relations

A schedule includes various **devices and techniques** for creating new class numbers through synthesis — allowing flexibility for future topics.

Examples (UDC Notation):

- **3+5** → Social and Natural Sciences (coordination)
- **5/6** → Science and Technology (range)
- **2:5** → Religion and Science (relation)
- ** ** → Journal of Science and Technology (group relation with form)

These devices help classify **interdisciplinary** or **composite** subjects dynamically.

60. Notation

Notation is the symbolic language of classification — numbers, letters, or symbols representing subjects. It provides structure, visibility, and usability to the classification system.

Ranganathan called notation the **"engine of practical classification"**, as it drives the organization and access of library materials.

Uses of Notation:

1. Indicates sequence and hierarchy of subjects.
2. Enables use of alphabetical index for reference.
3. Serves as a shorthand on books, cards, and shelves.
4. Supports chain indexing and subject cataloguing.

61. Qualities of a Good Notation

1. Clearly conveys order and hierarchy.
2. Simple and brief without loss of clarity.
3. Flexible and **hospitable** to new subjects.
4. Allows insertion and expansion without disrupting structure.

Knowledge grows continuously; a good notation adapts without chaos.

62. Types of Notation

a. Pure Notation:

- Uses only one kind of symbol (letters or numbers).
    - Example: **DDC** (pure numerical: 000–999).
    - Example: **RIC** (pure alphabetical: A–Z).

b. Mixed Notation:

- Combines letters, numbers, and symbols.
    - **Moderately mixed:** LCC, BC–2 — use letters + numbers.
    - **Highly mixed:** CC, UDC — use letters, numbers, punctuation.

Example (LCC):
U – Military Science
UB – Administration
UB200 – Commanders and Generals
UB210 – Command of Troops
UB270 – Spies

This pattern leaves gaps for future expansion, ensuring long-term adaptability.

63. Book Numbers

Even within a single class, many books may share the same class number. **Book numbers** (or **author numbers**) help differentiate them.
They are part of the **call number** and may reflect:

- **Author name or title** (alphabetical method).
- **Publication year** (chronological method).

Example (LCC):
Call number "DS451 .R43 2020" →

- DS451: Class number (Indian History).
- .R43: Cutter author number.
- 2020: Year of publication.

Book numbers ensure unique placement and precise retrieval.

64. Alphabetical Index

The **index** serves as a roadmap through the schedules, listing all terms alphabetically with their corresponding notations.

Functions:

1. Locates topics within classification schedules.
2. Brings together related subjects across different areas.

Types of Indexes:

- **Specific Index:** One entry per topic.
- **Relative Index:** Includes synonyms and cross-references (as in DDC and *Encyclopedia Britannica*).

In faceted systems like **CC**, only basic concepts are indexed, while **DDC** also includes synthesized subjects.

65. Revision Machinery

Classification systems age quickly as knowledge evolves. Thus, **continuous revision** is essential.

- Systems like **DDC** and **LCC** stay current through institutional backing (OCLC, Library of Congress).
- **CC** and **BC–2**, though theoretically strong, suffered due to lack of maintenance support.

A **governing body** or **revision committee** ensures:

- Inclusion of new subjects.
- Updates in structure and terminology.
- Long-term reliability and user trust.

Without sustained revision, even the best-designed system fades into obsolescence.

66. Grammar of Classification Design (Ranganathan)

Ranganathan turned classification from craft into a postulational science. His *grammar* breaks the work into planes and then gives canons (rules) for each plane so a classifier can *reasonably* decide what to split, how to order splits, and how to record them.

66.1. Planes of work
Ranganathan divides the work into three planes:

- **Idea plane** — the invisible but decisive planning work: choose characteristics, form facets, build arrays and chains.
  Example: deciding whether "Renewable energy" is grouped under Technology or Environment.

- **Verbal plane** — naming and wording classes; choosing terms for labels.
  Example: choosing “Climate change mitigation” vs “Global warming control” as the preferred caption.
- **Notational plane** — designing symbols (numbers, letters, punctuation) that implement the idea plane.
  Example: assigning “621.5” or “TQ 123” as the notation so items sort correctly on the shelf.

(Idea → Verbal → Notational = think it, name it, number it.)

66.2. Characteristics, parameters, attributes (short definitions)

- **Characteristic / Parameter** — an attribute used to divide a group into two or more classes (e.g., form, period, place).
  Examples: (1) **Language** (English / Hindi); (2) **Period** (Medieval / Modern); (3) **Form** (Handbook / Monograph).
- **Attribute** — any inherent or assigned trait of an entity; complex items may have many attributes.
  Examples: author nationality, publication year, intended audience.

Choosing *which* characteristics to use and *in what order* is the central idea-plane task.

66.3. Canons for Characteristics (idea-plane canons)

Ranganathan’s canons tell you what makes a *good* characteristic. Key ones (summarised) with examples:

1. **Canon of Differentiation** — a characteristic must split a group into at least two meaningful classes.
   Examples: sex (male/female), material (wood/metal/plastic), genre (fiction/non-fiction).
2. **Canon of Relevance** — the characteristic must be relevant to the purpose of the classification.
   Examples: using *format* (map vs. monograph) in a map collection; using *clinical specialty* in a medical library.
3. **Canon of Ascertainability** — the characteristic must be easily and reliably determined.
   Examples: publication year (clear), language (clear), author’s date of birth (may be unclear — avoid if possible).
4. **Canon of Permanence** — the characteristic should remain stable while the scheme’s purpose remains the same.
   Examples: chemical element (stable), basic subject area (stable); avoid transient buzzwords as primary characteristics.

(Also important: **relevant sequence** and **consistency** — once you pick an order of characteristics, apply it consistently.)

66.4. Canons for Succession (sequence of characteristics)

These canons guide the *order* in which characteristics are applied:

1. **Canon of Concomitance** — avoid using characteristics that are always found together (don’t pick redundant splits).
   Example: don’t split on “has heart” and “is animal” when both always co-occur for your universe.
2. **Canon of Relevant Succession** — sequence characteristics in the order that best serves the classification’s purpose.
   Example: in a law library, sequence “jurisdiction → topic → procedure”; in literature, “form → period → country”.

3. **Canon of Consistent Succession** — once you decide the order, stick to it across the scheme.
   Example: if you use "place → period → topic" for historical subjects, keep that order for all history arrays.

66.5. Canons for Array (how to order coordinate classes)

An *array* is a set of coordinate (same-rank) classes derived from one characteristic. The four canons:

1. **Exhaustiveness** — the array should cover the immediate universe completely (no stray items left out).
   Example: an array of document types should include monographs, theses, maps, serials if those exist in the universe.
2. **Exclusiveness** — members of the array should be mutually exclusive (no overlap).
   Example: "periodical" vs "monograph" should not overlap.
3. **Helpful Sequence** — order the classes so they're helpful (chronological, geographical, evolutionary, alphabetical, etc.).
   Examples: (a) chronological order for art movements; (b) geographical order for regional studies; (c) alphabetical where nothing better exists.
4. **Consistent Sequence** — similar arrays should use parallel ordering where appropriate.
   Example: if countries in one subject are ordered west→east, use same order in related arrays for consistency.

66.6. Canons for Chain (how to order hierarchical chains)

A *chain* is a ranked lineage (class → subclass → sub-subclass). Important canons:

1. **Canon of Decreasing Extension** — moving down a chain, intension (specificity) should increase and extension (breadth) decrease.
   Example: Science → Biology → Zoology → Entomology (each step more specific).
2. **Canon of Modulation** — a chain should include intermediate orders so there are no sudden jumps in specificity.
   Example: don't jump from "History" directly to "19th-century Indian textile artisans" without intermediate links like "19th century → India → Textile industry."

66.7. Filiatory / Sequence rules (subordination & coordination)

Ranganathan also gives canons for filiation (how subordinate classes relate):

- **Canon for Subordinate Clauses** — all subordinate classes should immediately follow their superordinate class (no unrelated classes inserted).
  Example: In an index, chapters on "Mughal architecture" and its subtopics should follow together.
- **Canon for Co-ordinate Classes** — among siblings, no less-related class should come between two more-closely related siblings.
  Example: don't place "Renaissance painting" between "Baroque sculpture" and "Baroque painting" if it breaks affinity.

66.8. Terminology and Notation canons (brief)

Ranganathan also provides canons for naming and numbering:

- **Canon of Currency** — use terms current among specialists.

- **Canon of Reticence** — avoid critical or value-laden labels.
- **Canon of Relativity / Expressiveness** — notation length should reflect class specificity and, where useful, code should express characteristics.
- **Canon of Mixed Notation** — mixed notation (letters + digits) is often practical.

66.9. Hospitality and Revision (practical design requirements)

Two special canons ensure long life:

- **Canon of Hospitality in Array** — you should be able to add new coordinate classes without disturbing existing numbers.
  Example: leave slots or use expandable notation.
- **Canon of Hospitality in Chain** — you should be able to append new subclasses at the chain's end without reworking earlier links.

Both support the Five Laws (library grows; save reader's time) by making the scheme extensible and stable.

67. Canons of Characteristics and Succession (Ranganathan)

Ranganathan's *canons of characteristics* guide how to choose the **basis of division**, while the *canons of succession* explain **how to apply those bases in sequence**. Both sets work in the *Idea Plane* — the mind's workshop of classification design.

67.1. Canon of Differentiation

This canon insists that a chosen characteristic must be capable of **dividing** the universe under study into at least two distinct subgroups.

- A **common** characteristic shared by all members is useless for division.
- The chosen characteristic must produce **difference**.

Examples:

1. "Being a student of Library Science" cannot divide a class of Library Science students — all share it.
2. "Colour" cannot divide crows — all are black.
3. "Gender" can divide students into *male* and *female*.
4. "Eye colour" or "eye shape" can divide human beings meaningfully.

67.2. Canon of Relevance

Even when a characteristic divides a group, it must also be **relevant** to the *purpose* of classification.

A division may be logically correct but practically useless. The "right" characteristic is not absolute — it's *purpose-dependent*.

Examples:

1. Dividing students by *height* is irrelevant when forming a mathematics class, but relevant for a *physical training* class.
2. Dividing books by *colour of cover* is irrelevant for library shelving, but may be relevant for *bookbinding research*.
3. Grouping by *educational qualification* is relevant for professional training, not for leisure clubs.

Relevance depends on purpose.
Choosing a relevant characteristic is not mechanical — it requires judgment, foresight, and experience.

67.3. Canon of Ascertainability

The chosen characteristic must be **objectively verifiable** — perceptible, measurable, or otherwise confirmable by evidence.

- It should be free from subjectivity or controversy.
- Abstract, mythical, or moral traits should be avoided.

Examples:

1. "Previous birth" as a basis for classifying humans is unascertainable.
2. "Brilliant" vs. "dull" teachers is subjective and unreliable.
3. "Language spoken" or "publication year" are ascertainable and safe.

Unascertainable or subjective traits lead to *confusion*, not *classification.*

67.4. Canon of Permanence

The chosen characteristic should be **stable and enduring**, not one that fluctuates frequently.

- Characteristics that change with time, mood, or circumstance make the classification chaotic.
- Use **natural, intrinsic, or structural traits** rather than transient ones.

Examples:

1. Dividing people by "colour of clothes" is temporary; "skin colour" is permanent.
2. "Fame" is fleeting; "genre of writing" is stable.
3. "Political ideology" may change overnight — poor basis for division.
4. "Migratory behaviour" in birds, though changing, is itself a *permanent* feature of that group — hence valid.

If change itself is permanent, that change can become a stable characteristic.

68. Canons of Succession of Characteristics

After selecting suitable characteristics, we must decide **in what order** to apply them. These canons regulate the sequence.

68.1. Canon of Concomitance

Avoid applying two or more characteristics that are **always found together** — such overlap adds nothing new.

Examples:

1. "Being animal" and "having blood" — nearly universal among vertebrates, so using both is redundant.
2. "Being a library professional" and "holding an MLIS degree" — often overlap.

Choose *independent* characteristics that produce *fresh distinctions*.

68.2. Canon of Relevant Succession

The order in which characteristics are applied should **serve the goal of classification.**

- Each successive characteristic should refine the division meaningfully.
- The sequence may differ by subject or purpose.

Examples:

1. In a **law library**:
    - *Jurisdiction → Topic → Procedure* (e.g., Indian → Criminal → Evidence).
2. In **literature**:
    - *Form → Period → Language → Author*.
3. In **history**:
    - *Period → Place → Event Type.*

A relevant succession leads to natural, helpful groupings — not artificial ones.

68.3. Canon of Consistent Succession

Once the order of applying characteristics is fixed, it must remain **uniform** throughout the scheme.

- Prevents confusion and contradictory sequences.
- Maintains logical unity across all branches of the classification.

Examples:

1. If "place" comes before "period" in history classes, the same order should apply in related subjects like archaeology.
2. Inconsistent orders (e.g., "period → place" in one section and "place → period" in another) confuse both indexers and users.

Consistency gives the classification **coherence and predictability**.

69. Canons of Succession of Characteristics (Ranganathan)

Once the right characteristics are chosen, the next question is: *in what order should they be applied?* Ranganathan's **Canons of Succession** answer that — they ensure divisions are logical, purposeful, and consistent.

69.1. The Canon of Concomitance

This canon says that **two successive characteristics should not be concomitant** — that is, they should not produce the *same grouping* twice.
If the second characteristic merely restates or overlaps with the first, no new division occurs.

Examples:

1. Dividing students by *age above or below 20*, and then by *year of birth before or after 1994* — both mean the same thing.
2. Dividing humans by *male/female*, and then by *men/women* — tautological, no new class created.

3. Dividing books by *fiction/non-fiction*, and then by *imaginative/non-imaginative* — identical in outcome.

The canon warns against **synonymous or redundant** criteria. Classification should always move from a general to a more *differentiated* level.

69.1.1. Broader to Narrower Succession

Though Ranganathan didn't state it explicitly, he implied a logical order: **broader → narrower**, or **general → specific**.

If we reverse this order, division collapses:

- Dividing *Indians* by being *Asians* makes no sense — all Indians are already Asians.
- Dividing *biologists* by being *scientists* repeats what's already true.

Other classifiers like **H.E. Bliss** and **W.C.B. Sayers** stated this principle outright: always move **from wider to narrower extension**, and **increasing specificity** at each step.

69.2. Canon of Relevant Succession

This canon addresses the *purposeful order* of applying multiple characteristics.
Even if all chosen characteristics are valid, the order must reflect **the goal and usefulness** of the classification.

69.2.1. Apply One Characteristic at a Time

If several are applied simultaneously, confusion results — creating **cross-classification** instead of a coherent hierarchy.

Example:
Classifying with four characteristics at once — *clan, language, caste, profession* —
→ "Rajputs, Punjabis, Brahmins, Armymen."
This is not an array but a **miscellaneous list** — one person may belong to several at once.

Hence, apply **one characteristic at a time**, in a controlled order.

69.2.2. Order of Application

There is **no universal sequence** of characteristics — only *more or less helpful* ones, depending on the user's need.
The right order is the one that serves the **purpose** best.

Examples:

1. **General Literature (Public Library):**
    - Language → Form → Author → Work
    - Readers usually look first for language, then for genre (novel, drama, poetry).
2. **Specialized Library (World Poetry Focus):**
    - Form → Period → Language
    - Here, form (poetry) takes precedence; language is secondary.
3. **Nineteenth-Century World Literature Library:**

- Period → Language → Form
- Focused on historical context first.

Arthur Maltby's advice: "There are several useful arrangements in some fields, but the aim is to offer the *most helpful* one."

69.2.3. No Order is Universal

Ranganathan likened this dilemma to a father torn between two daughters —
one married to a **farmer** praying for rain, the other to a **potter** praying for sun.
No arrangement satisfies everyone.

- In **DDC** and **CC**, Tagore's works are split by *form* (plays, fiction, poetry — all separate).
- In **UDC**, they're collocated under *one author*, regardless of form.

So, helpfulness depends on **context, users, and purpose** — never an absolute rule.

69.2.4. Facet Sequence

The **facet sequence** must also follow logical order.
Ranganathan's **Wall-Picture Principle** and **Cow-Calf Principle** ensure natural dependency among facets — one shouldn't interrupt another's logical place.

For instance, separating *Author* from *Work* by an intervening facet would be absurd.

The PMEST formula (Personality–Matter–Energy–Space–Time) reflects this descending concreteness — from specific to general.

69.3. The Canon of Consistent Succession

Once the order of applying characteristics is fixed, it should **remain constant throughout the system**.

- Prevents arbitrary changes by different classifiers.
- Ensures predictability in arrangement.
- Keeps the system intellectually stable over time.

Examples:

1. If you classify historical subjects as *place → period → event*, don't switch to *period → place* elsewhere.
2. If you use *discipline → form → topic* in sciences, keep the same sequence in all related areas.

The canon acts as a **guardrail** against inconsistency — protecting both logical integrity and user familiarity.

70. Introduction: Historical Perspectives

Modern library classification, as a formal discipline, began in the **late 19th century**. Early schemes like the **Dewey Decimal Classification (DDC)**, **Universal Decimal Classification (UDC)**, and **Library of Congress Classification (LCC)** emerged more from **intuition and genius** than from a guiding theory.

At this stage, classification design was more of an *art* than a science. Theoretical reflection followed practice.

Pioneers of Early Theory:

- **W.C.B. Sayers (1881–1960):** First to express classification design as a *system of canons*.

- **E.W. Hulme (1859–1951)** and **E.C. Richardson (1860–1939):** Early theorists who described, rather than formulated, principles behind existing systems.
- **H.E. Bliss (1870–1955):** Philosopher, theorist, and designer of *Bibliographic Classification (1940–1953)*; his works *Organization of Knowledge* (1929, 1933, 1939) explored empirical foundations of knowledge organization.

This was a **descriptive phase**, moving gradually toward a **scientific, dynamic phase** — one that would later be realized by **S.R. Ranganathan**.

71. Postulational Approach

The **postulational approach** marked the turning point from descriptive to scientific theory.
It means: designing a classification **based on pre-formulated principles** — *laws, canons, postulates, and devices* — rather than intuition.

When **S.R. Ranganathan** designed his **Colon Classification (1924–1933)**, he had no explicit theory. The structure came from instinct and training under Sayers. Later, he consciously extracted the theory underlying his work in *Prolegomena to Library Classification* (1937; 2nd ed. 1957; 3rd ed. 1967).

His contribution transformed classification into a **systematic, self-correcting science**.

Ranganathan's Postulational Framework:

- **Five Normative Laws of Library Science**
- **55 Canons** (rules of design and evaluation)
- **22 Principles**
- **13 Postulates**
- **10 Devices** for synthesis and adaptation

Through this, classification became **mechanizable, teachable, and testable** — no longer the preserve of intuition. The postulational approach provided tools for:

1. Designing new systems.
2. Evaluating scientific rigor of existing systems.
3. Comparing multiple schemes objectively.

Ranganathan's framework thus laid the **intellectual foundation** of modern classification theory.

72. Three Planes of Work

Ranganathan divided the entire process of classification design into **three interrelated planes**:

1. **Idea Plane** – Conceptual foundation: analyzing knowledge, defining subjects, and identifying characteristics, facets, and arrays.
2. **Verbal Plane** – Choosing precise and neutral terms to express ideas.
3. **Notational Plane** – Creating the symbolic representation (numbers, letters, signs).

In practice, these planes overlap. Work in one plane constantly informs and adjusts the others.
Ranganathan's genius lay in articulating their interdependence — ensuring the classification remains both **logical** and **workable**.

73. Idea Plane

This is the **core intellectual plane** — where classification truly begins.
Here, the classifier:

- Defines the **universe of knowledge**.
- Selects **characteristics of division**.
- Arranges **isolates into arrays and chains**.
- Chooses a **model** for subject organization.

In this plane, the abstract structure of knowledge takes shape — the "skeleton" upon which verbal and notational forms will rest.

Ranganathan prescribed **five sets of canons** for the work in this plane (covering Characteristics, Succession, Array, Chain, and Filiatory relations).

74. Diagram of Arrays and Chains

Arrays and chains form the basic architecture of classification.

- **Array:** A set of **coordinate classes** derived by one-time division of a parent class using a single characteristic.
    - Example: Continents — *Asia, Africa, Europe, America, Australia, Antarctica*.
- **Chain:** A **hierarchical sequence** from a broad class down to its most specific subclass.
    - Example: *Science → Biology → Zoology → Ornithology → Birds of Prey*.

Illustration (as described):
If A, B, C, D form one array, then A1, A2, A3 form another.
A21, A22, A23 form a third-order array, and A221, A222, A223 a fourth.
Chains connect these:

- A → A2 → A22 → A222 (one chain)
- D → D2 → D22 (another chain)

Arrays are **horizontal relations**, chains are **vertical**.
Together they reveal the dual structure of classification — **coordination** and **subordination**.

75. Canons for Arrays

An **array** represents all members of a single rank under one parent — like siblings in a family tree.
Example arrays:

- The **seven continents** of Earth.
- The **29 states** of India.
- The **main classes** of a classification scheme.

Each array results from applying **one characteristic only**.
Ranganathan established four canons for constructing arrays.

75.1. Canon of Exhaustiveness

An array must include **all possible members** of its immediate universe.
Nothing relevant should be left out.

Example:
Array of men by skin colour: *White, Black, Brown* → **not exhaustive**, as it excludes *pale yellow, fair, wheatish*, etc.

To maintain exhaustiveness:

- Include **all eligible classes**.
- Provide for a **residual "Others" category** to accommodate unlisted or future entities.
- Ensure **hospitality** for emerging subjects (e.g., in DDC, a new technology can fit within an empty slot).

A classification that is not exhaustive is **not comprehensive**.

75.2. Canon of Exclusiveness

Each entity should belong to **one and only one class** in the same array — **no overlap**.

Example:
A *dog* can't be placed simultaneously under *mammals* and *pets*.
It must belong primarily to *mammals* (biological) or *pets* (social), depending on the purpose of classification.

However, in the **digital environment**, controlled *cross-classification* (multiple placements) becomes useful — it enhances retrieval and increases *recall value* in OPACs or databases.

So, while **exclusiveness** is vital for print shelving, **plural access points** are welcomed in e-classification.

75.3. Canon of Helpful Sequence

The members of an array must be arranged in a **logical, systematic, and helpful order** — not arbitrary.

Possible helpful orders:

- **Chronological:** e.g., ancient → medieval → modern.
- **Geographical:** e.g., north → south, or west → east.
- **Alphabetical:** e.g., India → Japan → Kenya.
- **Evolutionary:** e.g., reptiles → birds → mammals.
- **Quantitative:** e.g., small → medium → large.

The key idea:

The order should make the user's journey from one subject to another **natural and predictable**.

75.4. Canon of Consistent Sequence

If a set of entities appears in multiple places, their **sequence should remain the same** everywhere.

Examples:

1. *Male → Female → Child* should appear in this order under Psychology, Education, and Law alike.
2. *Countries* should follow the same order under both *Geography* and *History*.

3. *Languages* should appear in identical order in *Linguistics* and *Literature* main classes (as in DDC, UDC, CC).

Consistency helps users transfer familiarity from one area of the schedule to another.
However, consistency is **not absolute** — it must remain *logical* and *helpful*.

76. Chain: Definition and Features

In any classification, when successive characteristics are applied to a group, all members no longer remain of equal rank. They divide into **wholes and parts, kinds and sub-kinds, species and subspecies** — forming what Ranganathan called a **chain of classes**.

A **chain** is a **line of entities in successive subordination** — a vertical sequence that runs from **general to specific**, or **whole to part**.

Examples:

- *World → Asia → India → Punjab → Amritsar*
- *Social Sciences → Economics → Financial Economics → Money → Banking*
- *Grandfather → Father → Son → Grandson*

In each, as we move down:

- **Extension (breadth)** decreases — the class covers fewer entities.
- **Intension (depth)** increases — the class becomes more specific.

This relation between general and specific is the essence of **hierarchy**; thus, *chain* and *hierarchy* are two sides of the same coin.

76.1. Canons for the Chain of Classes

Ranganathan prescribed two clear canons for arranging entities within a chain:

1. **Canon of Decreasing Extension**
2. **Canon of Modulation**

76.1.1. Canon of Decreasing Extension

The **order should proceed from general to specific**, or **whole to part**.

As one moves downward, each successive class is a **subset** of the previous one.

Examples:

- *Asia → South Asia → India → North India → Delhi*
- *Science → Physics → Optics → Light → Spectrum*
- *Social Sciences → Economics → Monetary Economics → Banking → Central Banking*

At every step:

- **Breadth** (extension) narrows.
- **Specificity** (intension) deepens.

The chain thus represents **increasing precision of thought** and **decreasing generality**.

76.1.2. Canon of Modulation

This canon demands that **no link be skipped** between levels of subordination.

A chain should have **smooth, continuous gradation** — no gaps, jumps, or omissions.

Example:

- *World → Asia → India → Punjab → Amritsar* is correct.
- Jumping directly from *India → Amritsar* omits *Punjab*, violating modulation.

Likewise, *India* should not be divided directly into *cities*; it must first be divided into *states and union territories*, then into *districts*, then *cities and towns*.

The canon ensures **logical continuity** and **natural progression** in hierarchical structure.

77. Filiatory Sequence

Arrays and chains exist naturally in **two dimensions** — horizontally (arrays) and vertically (chains).
But in a **printed schedule**, they must appear in a **single linear sequence**.
The *Canons for Filiatory Sequence* guide how to translate this two-dimensional structure into a readable, logical list.

There are two canons here:

1. **Canon of Subordinate Classes**
2. **Canon of Coordinate Classes**

77.1. Canon of Subordinate Classes

This canon directs that **subordinate (child) classes should immediately follow their parent class**.

- No unrelated or collateral classes should intervene.
- Species should stay next to their genus; children next to their parents.

Example:
If we list the following:
A, A1, A2, A21, A22, A221, A222, A223, A23, A3, B, C, D, D1, D2, D3
the order reflects each child following its parent in a **filiatory (lineal)** arrangement.

In a family analogy:

- You and your siblings are listed under your father.
- Your cousins appear under their parents (your uncle/aunt).
  This keeps relationships intact and visible.

77.2. Canon of Coordinate Classes

This canon ensures that **coordinate (sibling) classes** — those of equal rank under the same parent — are **kept together** and not separated by other groups.

For instance, if *A1, A2, A3* are coordinate subclasses under *A*, no unrelated class such as *B* should appear between them.

It's the logical counterpart of the **Canon of Subordinate Classes** —
together they preserve the *family structure* of knowledge within printed schedules.

In short:

- **Chains** express *vertical hierarchy* (general → specific).
- **Canons of Chain** ensure proper order and continuity.
- **Canons of Filiatory Sequence** ensure that when printed, these relationships stay visible — children beside parents, siblings beside siblings, no breaks in lineage.

78. Classification as Order

At its heart, classification is **the imposition or discovery of order**.
To classify is to arrange entities so that their relationships make sense — an order that helps users *see, find, and connect*.

In a library, classification isn't just logic for its own sake; it's **utilitarian**. It must serve readers. The final and visible result of this order is the **sequence of documents on shelves**, where each item's place mirrors its conceptual relation to others.

Different systems have achieved this helpful order in different ways:

- **Dewey Decimal Classification (DDC):** follows the *inverted Baconian order* (moving from abstract to concrete).
- **Expansive Classification (Cutter)** and **Library of Congress Classification (LCC):** use *evolutionary order* (simple to complex).
- **Bliss's Bibliographic Classification (BC):** arranges knowledge according to *scientific and educational consensus*.
- **Ranganathan's Colon Classification (CC):** introduces the **APUPA pattern** — *Alien – Penumbral – Umbral – Penumbral – Alien* — where each topic sits between its most and least related neighbors, optimizing shelf browsing.

Thus, every classification system embodies a philosophy of order — logical, evolutionary, or user-centered.

79. Levels of Order

According to Ranganathan, order operates on **multiple levels**:

1. Order among **main classes** (e.g., DDC's 000–900).
2. Order within **subclasses** (branches of each subject).
3. Order among **facets and isolates** within a single subject.
4. The **final shelf order** of documents.

To maintain helpful order across all these levels, Ranganathan developed his **Principles of Helpful Sequence**, which guide how entities in an array should be arranged for maximum utility.

80. Principles of Helpful Sequence (Eight Principles)

An **array** is a group of entities of equal rank derived by one characteristic.
Ranganathan suggested eight principles for arranging them — applying one at a time, depending on the nature of the entities and user needs.

80.1. Principle of Later-in-Time (Chronological Sequence)

Arrange entities in order of their **time of origin or occurrence**.
It's the natural "first-come, first-served" logic — simple and predictable.

Examples:

- Mughal emperors: *Babur → Humayun → Akbar → Jahangir → Shah Jahan → Aurangzeb.*
- Indian Prime Ministers: *Nehru → Shastri → Indira Gandhi → Morarji Desai → Vajpayee → Manmohan Singh.*
- Library collections by publication date: *older → newer editions.*

Chronological order is helpful in **history, literature, biography, and technology.**

80.2. Principle of Later-in-Evolution (Evolutionary Order)

Arrange entities in order of **evolution or development** — biological, social, or technological.
This principle often overlaps with chronology but emphasizes *progression in form or complexity*.

Examples:

- Animals: *Protozoa → Fishes → Reptiles → Mammals → Humans.*
- Societies: *Hunting → Agrarian → Industrial → Information society.*
- Computers: *First → Second → Third → Fourth → Fifth generation.*
- Political systems: *Anarchy → Monarchy → Oligarchy → Democracy.*

This order mirrors **natural or cultural evolution** and helps users perceive relationships of growth.

80.3. Principle of Spatial Contiguity (Geographical or Spatial Order)

Entities that occupy space should be arranged according to **physical proximity or natural adjacency.**

Examples:

- Indian states: *Jammu & Kashmir → Punjab → Himachal → Haryana → Delhi → Uttar Pradesh.*
- Planets: *Mercury → Venus → Earth → Mars → Jupiter → Saturn → Uranus → Neptune → Pluto.*
- Human body: *Head → Chest → Abdomen → Legs.*
- Architecture: *Foundation → Ground floor → Upper floors → Roof.*

Spatial order can follow several **sub-principles** depending on orientation:

- **Vertical:** bottom-up / top-down
- **Horizontal:** left-to-right / right-to-left
- **Circular:** clockwise / counter-clockwise
- **Radial:** center-to-periphery / periphery-to-center
- **Away-from-position:** relative to a chosen base point

Spatial contiguity works well in **geography, anatomy, astronomy, and engineering.**

80.4. Principle of Quantitative Measure

Arrange entities by **increasing or decreasing quantity or magnitude.**

Examples:

- Currency: *₹1 → ₹2 → ₹5 → ₹10 → ₹20 → ₹50 → ₹100 → ₹500 → ₹2000.*
- Libraries: *National → State → District → City → Village.*
- Town planning: *Village plan → Town plan → City plan → Metropolitan plan.*
- Atomic structure: *Atoms → Molecules → Compounds.*

It's a numerical, easily measurable order — clear and predictable.

80.5. Principle of Increasing Complexity

Arrange entities in order of their **structural or conceptual complexity.**

Examples:

- Linguistics: *Letter → Syllable → Word → Phrase → Sentence → Paragraph → Chapter → Book.*
- Mathematics: *Simple equation → Quadratic → Cubic → Differential.*
- Biology: *Cell → Tissue → Organ → Organ system → Organism.*

Complexity often correlates with both **quantity and evolution** — but emphasizes structural hierarchy rather than mere size.

80.6. Principle of Canonical Sequence

Respect **traditional or culturally fixed order**, even if it lacks logical reasoning.

Examples:

- *Sita–Ram*, not *Ram–Sita.*
- *Algebra–Geometry*, not *Geometry–Algebra.*
- *Radha–Krishna*, not *Krishna–Radha.*

Tradition has its own authority. Where a sequence is historically or culturally entrenched, classification should not disrupt it unnecessarily.

80.7. Principle of Literary Warrant

Arrange entities according to **their prominence or frequency in literature or use.**

The more frequently something appears in documents or user searches, the earlier it should appear.

Examples:

- Crop seeds: *Rice → Wheat → Rye → Maize* (based on common use).
- Library subjects arranged in order of research demand or publication volume.

This principle ensures **practical usefulness** and reflects **real-world distribution of knowledge.**

80.8. Principle of Alphabetical Sequence

If no other principle fits, arrange entities **alphabetically.**

Examples:

- UN Member States: *Afghanistan → Albania → Algeria → ...*

- Human emotions in LCC (BF575): *Anger → Awe → Fear → Hate → Love.*
- Names in dictionaries or bibliographies.

Alphabetical order is **neutral, predictable, and infinitely hospitable**, making it ideal for retrieval — though Ranganathan saw it as the *least scientific* method, more a **tool of access** than of true classification.

81. Exceptions to the Helpful Order

Ranganathan admitted that *no principle is absolute* — all are subject to exceptions when user needs or context demand otherwise.

Two notable exceptions are:

81.1. Principle of Local Variation
A subject may be taken out of its logical position to highlight **local or cultural significance.**

- Example: In Indian libraries, *Philosophy*, *Language*, or *History* related to India may be given precedence.
- DDC allows alternative arrangements (e.g., placing *400 Language* near *800 Literature*).
- Bliss's BC and DDC both provide **alternative schedules** to accommodate local emphasis.

81.2. Reader's Interest Classification
Classifications ultimately serve **users, not logic**.

- Systems like **DDC** have surveyed user preferences to modify sequence.
- Many **special libraries** adopt **reader-interest order** rather than strict logical order.
- For example, arranging books on *competitive exams* or *job skills* together — though they span different subjects — increases usability.

Ranganathan summed it up simply:

"Classification is not an exhibition of logic, but an instrument of service."

In Essence:

Principle	Basis of Order	Example
Later-in-Time	Chronology	Kings, Prime Ministers
Later-in-Evolution	Developmental	Species, Societies
Spatial Contiguity	Geography/Space	States, Planets
Quantitative Measure	Magnitude	Currency, Libraries
Increasing Complexity	Structure	Sentences, Equations
Canonical Sequence	Tradition	Sita–Ram, Algebra–Geometry
Literary Warrant	Usage	Rice–Wheat–Rye
Alphabetical Sequence	Name order	Dictionary, Countries

Simple Chart to Understand hierarchy of Classification Order

CLASSIFICATION IS ORDER

▼

HISTORICAL TYPES OF ORDER

- Ranganathan – APUPA Pattern
- Dewey Decimal (DDC) – Inverted Baconian order
- Cutter's Expansive Classification – Evolutionary order
- Library of Congress (LCC) – Adapted Cutter's order
- Bliss (BC) – Scientific and educational consensus

▼

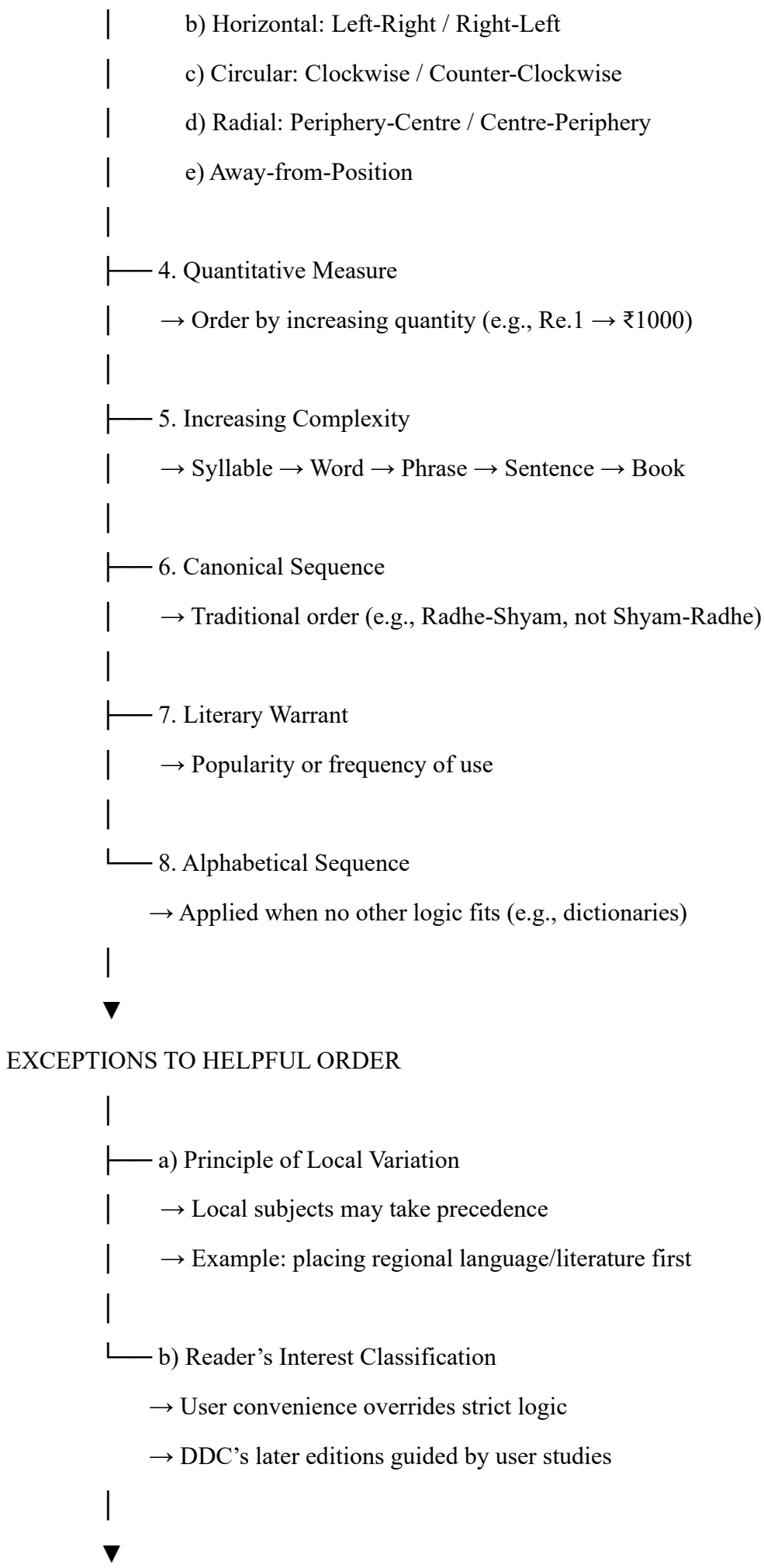
LEVELS OF ORDER

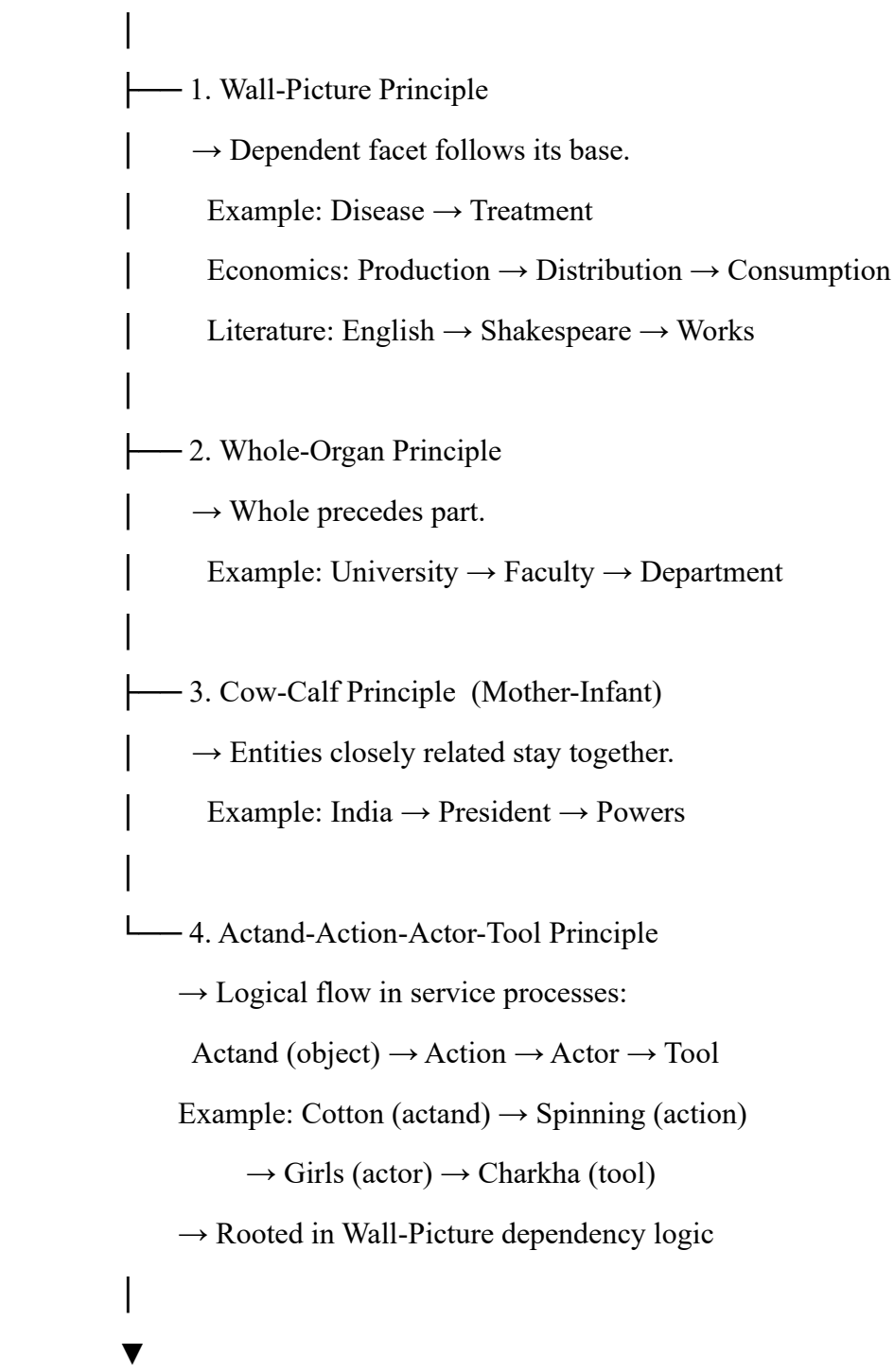
- Order of main classes
- Order of facets within each class
- Order of isolates (subdivisions) within facets

▼

PRINCIPLES OF HELPFUL SEQUENCE (8 principles)

- 1. Later-in-Time
  - → Chronological order (e.g., Kings, PMs)
- 2. Later-in-Evolution
  - → From simple to complex (e.g., Amoeba → Mammal)
- 3. Spatial Contiguity
  - → Arrange by physical or geographical proximity
  - Sub-principles:
    - a) Vertical: Bottom-Up / Top-Down


b) Horizontal: Left-Right / Right-Left
c) Circular: Clockwise / Counter-Clockwise
d) Radial: Periphery-Centre / Centre-Periphery
e) Away-from-Position
4. Quantitative Measure
→ Order by increasing quantity (e.g., Re.1 → ₹1000)
5. Increasing Complexity
→ Syllable → Word → Phrase → Sentence → Book
6. Canonical Sequence
→ Traditional order (e.g., Radhe-Shyam, not Shyam-Radhe)
7. Literary Warrant
→ Popularity or frequency of use
8. Alphabetical Sequence
→ Applied when no other logic fits (e.g., dictionaries)
EXCEPTIONS TO HELPFUL ORDER
a) Principle of Local Variation
→ Local subjects may take precedence
→ Example: placing regional language/literature first
b) Reader's Interest Classification
→ User convenience overrides strict logic
→ DDC's later editions guided by user studies


PRINCIPLES OF FACET SEQUENCE
1. Wall-Picture Principle
→ Dependent facet follows its base.
Example: Disease → Treatment
Economics: Production → Distribution → Consumption
Literature: English → Shakespeare → Works
2. Whole-Organ Principle
→ Whole precedes part.
Example: University → Faculty → Department
3. Cow-Calf Principle (Mother-Infant)
→ Entities closely related stay together.
Example: India → President → Powers
4. Actand-Action-Actor-Tool Principle
→ Logical flow in service processes:
Actand (object) → Action → Actor → Tool
Example: Cotton (actand) → Spinning (action)
→ Girls (actor) → Charkha (tool)
→ Rooted in Wall-Picture dependency logic

82. Facet Sequence

Ranganathan called the **determination of a helpful sequence of facets** one of the most delicate and vital parts of classification design.
The order in which facets are cited — whether in a class number, a subject heading, or an index term — governs how a subject unfolds from its most general to its most specific aspects.
He wrote:

“The syntax of facets, based on postulates and principles, automatically yields a sequence of subjects giving satisfaction to the majority of readers.” (*Prolegomena*, XJ1)

This **facet sequence** (or **citation order**) gives structure to complex subjects and ensures logical expansion from broader to narrower topics — much like a sentence’s grammar dictates its sense.

82.1. What Is a Facet Sequence?

A **facet sequence** is the *order in which the component facets of a compound subject are arranged* to express its meaning clearly and consistently.

For instance, if the subject is **Academic Libraries**, one might encounter facets such as:

- Patrons
- Technical services
- Public services
- Administration
- Relations with other libraries

These aspects need to be placed in a sequence that feels **logical, predictable, and helpful** for users.

This ordering — the **syntax of facets** — follows rules similar to grammar.
In indexing, it is known as **citation order**.

All such sequences ultimately follow Ranganathan's **PMEST formula**:
Personality – Matter – Energy – Space – Time

This general sequence proceeds from **concrete to abstract**, and has proven to work across all subjects — in classification, indexing, and bibliography.

82.2. Principles of Facet Sequence (Ranganathan)

Ranganathan formulated several principles to determine logical order among facets. Each principle ensures that dependent ideas follow their bases — maintaining clarity and natural flow.

82.2.1. Wall-Picture Principle

If one facet depends on another for its existence, the dependent must follow the independent.
A *picture* depends on a *wall* to exist — hence the name.

Examples:

- *Disease → Treatment* (no treatment without disease)
- *Production → Distribution → Consumption* (flow of economic activity)
- *Literature → English → Shakespeare → Works* (each level depends on the preceding one)

This principle ensures the order mirrors **natural dependency or life-cycle sequence**.
It often aligns with the **Later-in-Time** principle.

82.2.2. Whole–Organ Principle

When one facet is a **part** or **organ** of another, the logical order is **Whole → Organ → Part**.

Examples:

- *University → Faculty → Department → Class → Section*
- *Parliament → Lok Sabha → Committees*
- *Human Body → Hand → Fingers*

It creates a **hierarchical order** — the most common and intuitively natural type of sequence in science and administration.

82.2.3. Cow–Calf Principle (Mother–Infant Principle)

Some facets, though separate, are **so closely related** that separating them would break meaning.
Like a calf that cannot live apart from its mother, these facets must stay **side by side**.

Examples:

- *India → President → Powers* (functions follow immediately after the office)
- *Court → Judge → Duties*
- *Hospital → Doctor → Patients*

This principle stresses **proximity** — keeping connected facets together without interruption by unrelated ones.

82.2.4. Actand–Action–Actor–Tool Principle

This compound principle applies where a **process or service** involves multiple participants.

- **Actand:** The object acted upon
- **Action:** The activity or process
- **Actor:** The agent performing the action
- **Tool:** The instrument used

Example (Ranganathan's own):
Girls (actor) spinning (action) cotton (actand) on charkha (tool)

The citation order becomes:
Cotton – Spinning – Girls – Charkha

The same logic applies in other contexts:

- *Steel – Welding – Worker – Machine*
- *Patient – Surgery – Surgeon – Scalpel*

This principle is an extension of the **Wall-Picture dependency** idea — one step in the sequence depends on the prior.

82.3. Other Views and Developments

The **Classification Research Group (CRG)** of London extended Ranganathan's work by offering a more detailed, generalized formula known as the **CRG Citation Order**:

Thing – Kind – Part – Property – Material – Process – Operation – Patient – Product – Byproduct – Agent – Space – Time

Although longer, it still rests on the same foundation — the **dependency order** implied by the Wall-Picture principle.
Ranganathan would have easily reduced it to PMEST categories spread across *Rounds and Levels*.

82.4. Absolute Syntax

Ranganathan once imagined an **absolute syntax** — a universal sequence of facets intuitively accepted by all minds.
But he later admitted this ideal was unreachable:

- There is no *natural* or *universal* order in nature or thought.
- All order is **constructed, not discovered** — shaped by purpose, culture, and cognition.

Hence, classification remains a **social instrument**, not a reflection of cosmic truth.
The PMEST order, however, remains the **closest functional model** to that ideal.

83. APUPA Pattern: The Ultimate Order

The **visible outcome** of all this order is what users finally see — the **arrangement of books on shelves**.
Ranganathan devised the **APUPA pattern** to make this arrangement meaningful and self-instructive.

APUPA stands for:

- **A – Alien region** (unrelated subjects)
- **P – Penumbral region** (partially related subjects)
- **U – Umbral region** (core subject with highest density)
- **P – Penumbral region** (advanced or specialized extensions)
- **A – Alien region** (next subject's periphery)

83.1. How It Works

Think of a shelf sequence like this:

Zone	Example	Description
A (Left)	Mathematics	Precursor or adjacent subject
P (Left)	Physics glossaries, bibliographies	Approach zone (introductory)
U	Core Physics texts	Umbral zone — dense, central
P (Right)	Applied Physics, Research, Associations	Advanced or peripheral
A (Right)	Astronomy	Next neighboring discipline

This arrangement mirrors **a learner's natural progression**:
approach → grasp → advance → move outward.
It makes browsing intuitive and promotes **self-learning** — a form of "classification as pedagogy."

Only Ranganathan's Colon Classification formalized such a **didactic shelf pattern**.

83.2. Book Numbers and Sub-Arrangement

Even within a single umbral subject, order is necessary to avoid chaos.
This is achieved through **book numbers**, which distinguish multiple works under the same class number.

Two main traditions exist:

1. **Chronological order (Ranganathan):**
    - Oldest → newest publications.
    - Encourages awareness of a subject's evolution.

2. **Alphabetical order (Dewey, LCC):**
    - By author's name or title.
    - Quicker for locating specific works.

Each has its logic — one fosters *learning through sequence*, the other *efficiency in retrieval.*

84. Glossary of Key Terms

- **APUPA Pattern:** Shelf order in which *core (umbral)* documents are surrounded by *penumbral (related)* and *alien (unrelated)* zones — ensuring gradual transition between subjects.
- **Array:** Group of entities of equal rank, arranged in a logical or helpful order.
- **Book Number:** Symbol added to class number to uniquely identify each item and sub-arrange within the same subject.
- **Citation Order:** The logical order of facets in a compound subject (synonymous with *facet sequence*).
- **Dependency Order:** Arrangement where each entity depends on the previous (e.g., Disease → Treatment).
- **Facet Formula:** Another term for citation order in faceted systems.
- **Helpful Sequence:** Logical, user-friendly order of entities in an array — eight principles govern its use.
- **Inversion Principle:** The shelf order reverses the citation order — moving from **general to specific** instead of **specific to general**.
    - Example: in CC, PMEST (specific → general) becomes **TSEMP** (general → specific) on shelves.

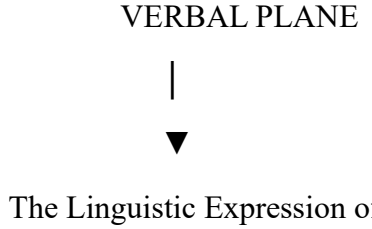
85. Verbal Plane

Work in the **Idea Plane** deals with pure, abstract concepts — the raw materials of thought. But without names, these ideas remain airy and unreachable. The **Verbal Plane** translates them into language — *it gives words to thought*.

If the idea plane is the **message**, the verbal plane is its **medium**.
Dr. Samuel Johnson's phrase still fits: *"Language is the dress of thought."*

At this stage, each concept developed in the Idea Plane — arranged in arrays, chains, and filiatory sequences — is given a **"pucca name"**, a standardized term that allows it to be expressed, communicated, and indexed. This process is not cosmetic. It's functional: without names, ideas cannot circulate.

In technical fields, these standardized names are called **terms**, and their controlled assignment is handled through the science of **terminology**. Thus, the verbal plane is the plane of **terminology management** — where classification meets language.



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├─ Definition:

│ → Translates airy ideas into standardized terms.

│ → “If the Idea Plane is the message,

│ the Verbal Plane is its language.”

│

├─ Function:

│ → Deals with terminology management.

│ → Provides pucca names to concepts arranged in the Idea Plane.

│ → Enables communication, indexing, and retrieval.

│

├─ Importance:

│ → “An idea expressed in proper words

│ is worth thousands in the mind.”

│ → Language gives shape and visibility to thought.

│

▼

1. NATURE OF LANGUAGE

│

├─ Language is the vehicle of thought and civilization.

├─ Enables intellectual and cultural communication.

└─ “Language is the dress of thought.” — Samuel Johnson

│

▼

2. PARADOX OF HOMONYMS AND SYNONYMS

│

├─ Language is both rich and poor:

│ → Rich: many words for one idea (synonyms).

│ → Poor: one word for many ideas (homonyms).

│

├─ Dissipation of thought occurs between ideas and words.

└ Leads to ambiguity, vagueness, and confusion.

│

▼

2.1 SYNONYMS (Richness)

│

├ Definition: Different words with same meaning.

├ Examples:

│ → Wages / Pay / Salary

│ → Sun: Surya / Aditya / Prabhakar

│ → Krishna: Gopal / Kanhiya / Keshav

└ Note: True synonyms do not exist; each word carries nuance.

│

▼

2.2 HOMONYMS (Poverty)

│

├ Definition: One word, multiple meanings.

├ Examples:

│ → Cricket (game / insect)

│ → Bridge (structure / card game)

│ → Beas (river / town)

│ → Ganga (river / person)

├ Ranganathan: “Order” has 250 meanings in English.

└ Imagination moves faster than language evolution.

│

▼

3. CAUSES OF DUALITY IN LANGUAGE

│

├ Cultural & environmental roots of language diversity.

│ → Desert dwellers: many terms for “sand.”

│ → Indians: distinct kinship terms; English: generalized.

│

├ Duality adds flexibility and beauty to literature,
│ but confusion in science and classification.
└ Ambiguity fuels creativity but hinders precision.
│
▼

4. BARRIERS IN LANGUAGE
│
├ Uncontrolled vocabulary leads to:
│ → Ambiguity, redundancy, omission.
│ → Retrieval errors in databases and indexing.
│
├ Ranganathan:
│ “Homonyms and synonyms are classification wreckers.”
│
├ Phyllis A. Richmond:
│ “Uncontrolled vocabulary is disastrous for retrieval.”
└ Controlled terminology is essential for clarity and precision.
│
▼

5. VOCABULARY CONTROL
│
├ Objective:
│ → Achieve one-to-one correspondence between concept and term.
│ → Eliminate homonyms and synonyms.
│
├ Maturity of a discipline =
│ degree of terminology standardization.
│
├ Benefits:
│ → Clarity and precision in communication.
│ → Facilitates information exchange and retrieval.

5.1 ORGANISATIONAL EFFORTS

- 10,000+ tools exist globally for terminology standardization.
- Major organizations:
  - → ISO Technical Committee 37 (est. 1952)
    - • Promotes global terminology management.
  - → TermNet (UNESCO, 1988)
    - • International network for terminology cooperation.
  - → CSTT (India, 1961)
    - • Commission for Scientific and Technical Terminology under Ministry of HRD; develops Indian language terms.

5.2 WORK OF RANGANATHAN

- Advocated use of precise LIS terminology.
- Encouraged learning technical terms of other subjects.
- Developed numerous LIS terms; defined them meticulously.
- Chaired Document Sectional Committee, BIS (ISI:EC2)
  - → Glossary of Cataloguing Terms (IS:796–1959)
  - → Glossary of Classification Terms (IS:2550–1963)
- Left a legacy of standardized terminology for LIS.

5.3 LANGUAGE IS LIVING AND DYNAMIC

- Terms evolve, meanings shift, new terms emerge.
  - → “Open Access,” “Networks,” “Browsing” redefined digitally.

├─ Language mirrors social and technological change.

└─ Controlled vocabulary must stay current.

│

▼

6. TERMINOLOGY MANAGEMENT

│

├─ Aim:

│ → Select and display standardized terms for vocabularies.

│

├─ Svenonius' Principles:

│ 1. Literary Warrant – derive terms from published works.

│ 2. Use Warrant – base on user requests and common usage.

│ 3. Scholarly Usage – prefer specialized usage in research IR.

│

├─ Ranganathan's Guidelines (Prolegomena GA5):

│ 1. Delimit vagueness; eliminate ambiguity.

│ 2. Establish standard terminology free of homonyms/synonyms.

│ 3. Coin new terms as new ideas emerge.

│

▼

7. CANONS FOR TERMINOLOGY

│

├─ Canon of Context

│ → Term read in the context of its parent class.

│ → Example: under "Salts" list "Single," "Double," "Complex"

│ instead of repeating the word "Salts."

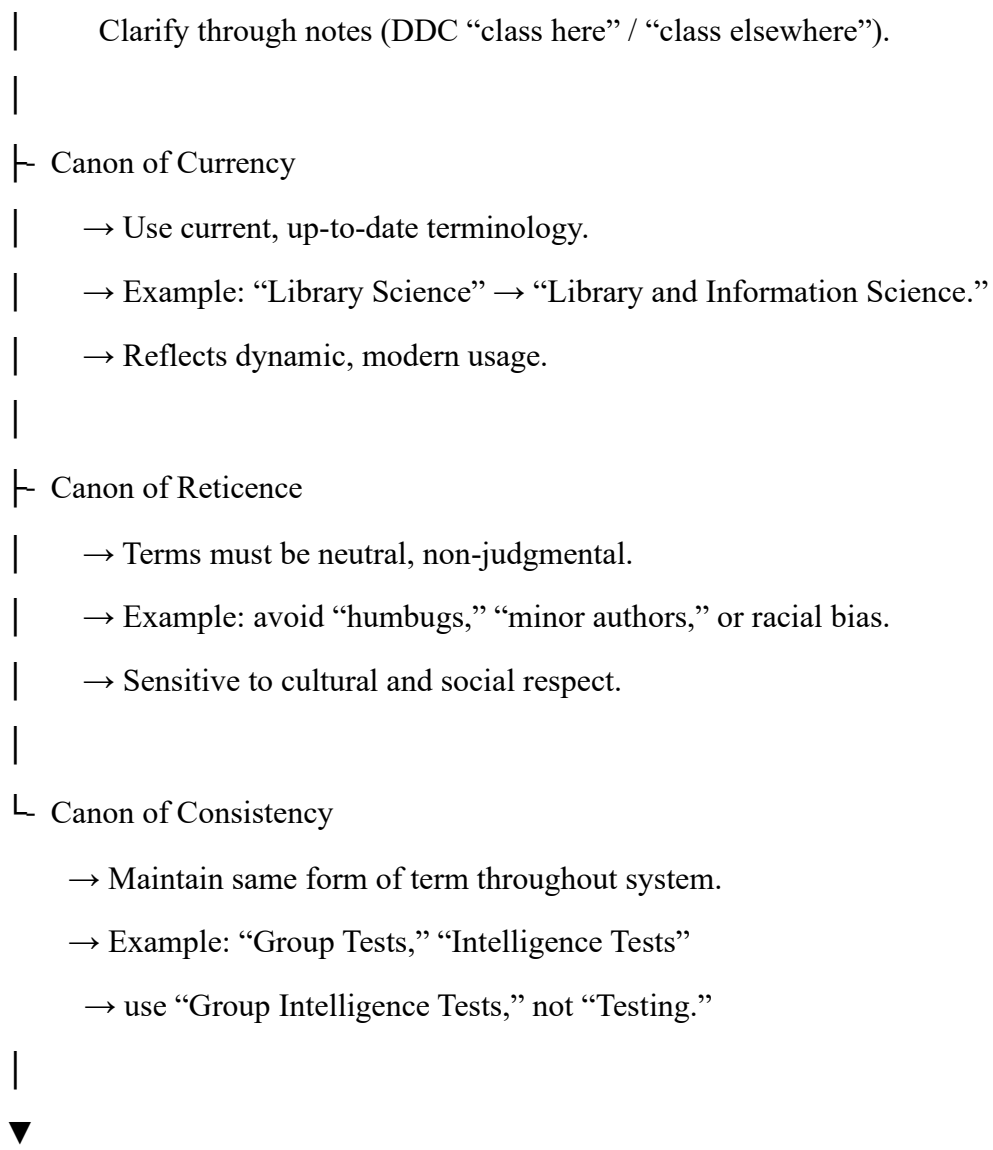
│ → Prevents orphan terms; maintains hierarchy.

│

├─ Canon of Enumeration

│ → Define scope explicitly through sublisting.

│ → Example: "Dynamics" — part of math or physics?


Clarify through notes (DDC “class here” / “class elsewhere”).
Canon of Currency
→ Use current, up-to-date terminology.
→ Example: “Library Science” → “Library and Information Science.”
→ Reflects dynamic, modern usage.
Canon of Reticence
→ Terms must be neutral, non-judgmental.
→ Example: avoid “humbugs,” “minor authors,” or racial bias.
→ Sensitive to cultural and social respect.
Canon of Consistency
→ Maintain same form of term throughout system.
→ Example: “Group Tests,” “Intelligence Tests”
→ use “Group Intelligence Tests,” not “Testing.”

85.1. Nature of Language

Language is the **vehicle of thought** and the medium of all human exchange — social, academic, technical, and creative.
Without language, civilization and knowledge would not exist.
It’s the human species’ most powerful invention — allowing us to encode ideas, transmit them, and build upon them collectively.

Yet, language is not perfect. It is both **a bridge and a barrier** between minds.

85.2. The Paradox of Language: Rich and Poor

Every language is at once *rich* and *poor*.
Rich — because it offers many words for the same concept.
Poor — because the same word may carry many meanings.
This duality — **synonymy and homonymy** — makes language flexible for literature but dangerous for scientific classification.

85.2.1. Synonyms: The Richness of Language

A language is “rich” because it has **many words for a single idea**.
Examples:

- *Wages, pay, salary* — all denote remuneration.

- In Hindi, *Suraj, Aditya, Dinkar, Prabhakar, Ravi* — all mean "the sun."
- *Lord Krishna* has countless names: *Gopal, Kanhiya, Murli Manohar, Keshav, Shyam.*

But as Ranganathan noted, there are no **true synonyms**.
Each carries its own shade of meaning, tone, or context.
Great writers — Valmiki, Shakespeare, Homer — choose the one *right* word, not just a near one.

For literature, this diversity is beauty.
For classification, it is confusion.

85.2.2. Homonyms: The Poverty of Language

Language is also "poor" because one word may have **multiple meanings**.
Examples:

- *Cricket* — a game, or an insect.
- *Bridge* — a structure, or a card game.
- *Beas* — a river, and a town in Punjab.
- *Ganga* — a river, and a person's name.

In English, almost every word is polysemous.
The word *order* reportedly carries over **250 meanings**.
Even *classification* has five distinct senses, says Ranganathan.

Language lags behind thought; imagination races faster than vocabulary.
New discoveries and ideas often lack ready-made words — forcing new terms or metaphors into being.

85.3. Causes of Duality in Language

Homonyms and synonyms arise from **culture, environment, and human experience.**
A desert tribe has dozens of words for *sand.*
In India, kinship terms are specific (*chacha*, *mama*, *tau*), while English uses one vague word — *uncle.*

This duality enriches **literature** and **poetry** — allowing ambiguity, metaphor, and play.
But for **science, documentation, and libraries**, this same duality breeds ambiguity and confusion.
A single phrase like *"To be or not to be"* spawns infinite interpretations — delightful for art, disastrous for indexing.

85.4. Barriers of Language

Language, like classification, is a **retrieval system** — it stores and recalls knowledge.
But its natural evolution makes it inconsistent.

Uncontrolled vocabulary — filled with synonyms, homonyms, and colloquial variants — becomes a major obstacle in **information retrieval.**
Free-text searching, uniterms, and uncontrolled keywords create redundancy, ambiguity, and omission — the enemies of precision.

Phyllis A. Richmond called uncontrolled vocabulary "**disastrous for information retrieval**."
Ranganathan warned that homonyms and synonyms are **"classification wreckers."**

They derail thought, waste mental effort, and lead to misinterpretation.
As he observed in *Prolegomena (GA3)*:

“Thought gets derailed along unintended lines, leading to puzzles or waste of energy in retracing the steps and making the thought go along right lines.”

86. Vocabulary Control

1. **Meaning:**
    - In science communication, precision is vital — one term should convey one meaning only.
    - Ideal situation: *one-to-one correspondence* between **concepts** and **terms.**
    - Aim: Eliminate **homonyms** (one word, many meanings) and **synonyms** (many words, one meaning).
    - Achieved to a large extent in **natural sciences**, still developing in **social sciences** (including LIS).
    - A **mature discipline** = standardized terminology.
    - Controlled vocabulary ensures clear communication, accurate indexing, and efficient information retrieval.

Examples:

- In Chemistry, H_2O means only water — not symbolic, but exact.
- In Library Science, *catalogue*, *index*, *classification* — each must carry a distinct, stable meaning.

86.1 Organisational Efforts

1. **Global and National initiatives:**
    - **ISO/TC37 (1952):** International Standards Organization’s Technical Committee for Terminology.
        - Develops rules and principles for terminology creation and management.
        - Promotes cooperation among national terminology bodies.
    - **TermNet (1988):** International Network for Terminology (founded by UNESCO).
        - Provides training, workshops, and coordination of international terminology projects.
    - **National Language Academies:** Work for linguistic purity and modernization.
        - Example: *Académie Française*, *Royal Spanish Academy*, *Hindi Terminology Commission.*
    - **India – CSTT (1961):** Commission for Scientific and Technical Terminology under HRD Ministry.
        - Standardizes scientific and social science terms in all Indian languages.
        - Published bilingual and trilingual glossaries.

Examples:

- CSTT’s “Glossary of Library and Information Science” provides Hindi equivalents for English LIS terms.

- ISO/TC37 guidelines help build multilingual databases for translation software.

86.2 Work of Ranganathan

1. **Role:**
    - Advocated for **technical precision** in library language.
    - Insisted librarians use *standard LIS terms* and understand *other subjects' terminology* for better reference and indexing.
    - Used and defined terms carefully in his writings.
2. **Contributions:**
    - Coined numerous LIS terms like *Book Number, Chain Indexing, Facet Analysis, Library Legislation*.
    - Chaired **Document Sectional Committee (ISI: EC2)** — created official glossaries:
        - *IS:796–1959* — Glossary of Cataloguing Terms.
        - *IS:2550–1963* — Glossary of Classification Terms.
    - Stressed continuous development and uniform use of terms coined in LIS.

Examples:

- Term *Book Number* uniquely identifies items within a class number.
- *Chain Indexing* became a core concept in subject cataloguing derived from his theory.

86.3 Language Is Living and Dynamic

1. **Nature:**
    - Language evolves — new terms appear; old ones fade or change meaning.
    - Technical terms also evolve with technology and cultural context.
    - Same term may differ across disciplines or languages.
2. **Examples of change:**
    - *Browsing:* once meant physical shelf scanning, now includes online searching.
    - *Network:* once "group of libraries," now "digital communication system."
    - *Open Access:* changed from "open-shelf system" to "free online publication."
    - *Home Science → Home Management* (DDC update).
    - *Library Science → Library and Information Science.*

87. Terminology Management

Elaine Svenonius' Principles for Selecting Terms:

1. **Literary Warrant:**
    - Terms should come from **published literature** of the subject.
    - Among synonyms, select the **most frequent** in scholarly use.

- Ensures relevance and authenticity.
- Example: Use "Information Retrieval" (not "Data Search") since it dominates LIS literature.

2. **Use Warrant:**
   - Terms should match **user's natural vocabulary.**
   - Based on actual usage patterns and search logs.
   - Example: Use "Job" rather than "Occupation" if users frequently search that term.
3. **Scholarly Usage:**
   - Specialized databases can prefer technical over common terms.
   - Example: "Bibliometrics" instead of "Book Statistics" for research databases.

87.1 Ranganathan's Rules for Glossary Organization (Prolegomena, GA5)

1. **Reduce vagueness** and remove ambiguity from terms.
2. **Establish standardized terminology** — free from synonyms and homonyms.
3. **Create new terms** systematically when new ideas or concepts appear.

Example:

- The term *Facet* was coined to represent a basic division of a subject.
- *Chain* was used metaphorically for hierarchical sequence of classes.

88. Ranganathan's Canons for Terminology

1. Canon of Context

- Every term should be read in the **context of its parent class**.
- Avoid repetition of the broader class name.
- Keeps schedules concise and avoids redundancy.
  Examples:
  - Instead of "Single Salts, Double Salts," write **Salts — Single, Double, Complex.**
  - *Child, Male, Female* under Psychology imply *Child Psychology*, *Male Psychology*, *Female Psychology*.

2. Canon of Enumeration

- Explicitly list subdivisions to **define the scope** of a subject.
- Prevents confusion when a subject's boundaries are debated.
- Example situations:
  - *Dynamics* → debated between *Physics* and *Mathematics.*
  - *Documentation* → part of *Library Science* in CC, independent class in UDC.
- DDC uses "**Scope Notes**" and "**Class Here/Class Elsewhere**" notes for clarity.

3. Canon of Currency

- Use **current, accepted terminology** among subject specialists.
- Update old or obsolete terms regularly.
  Examples:
  - *Library Science → Library and Information Science.*
  - *Home Science → Home Management.*
  - *Negroes → African Americans.*

4. Canon of Reticence

- Terms should be **neutral**, not critical, biased, or judgmental.
  Examples:
  - DDC 14th edition used "Humbugs" for parapsychologists — now corrected.
  - Avoid "Major" and "Minor" authors in literature classification.
  - Avoid politically or culturally insensitive words.
- Librarians classify knowledge, not judge it.

5. Canon of Consistency (Implied)

- The **form** of a term should stay consistent across the vocabulary.
  Examples:
  - If you use "Group Tests" and "Intelligence Tests," prefer **"Group Intelligence Tests"** (not "Testing").
  - Use same grammatical form — noun or adjective — throughout.

88.1 Extra Examples for Understanding

- **Homonym problem:**
  - *Bat* (animal) vs *Bat* (sports equipment).
  - *File* (document) vs *File* (tool).
- **Synonym confusion:**
  - *College* vs *Institute* vs *Academy.*
  - *Document* vs *Record.*
- **Vocabulary control solutions:**
  - Use *Preferred Terms* (authorized headings).
  - Cross-reference others as *See* or *See also* entries.
  - Example: *Catalogue — See also: Indexing; Classification.*

88.2 Practical Tools for Vocabulary Control

1. **Thesauri:** e.g., *ERIC Thesaurus*, *Library of Congress Subject Headings (LCSH).*
2. **Authority Files:** Maintain authorized forms of names, subjects, and titles.
3. **Classification Schedules:** DDC, UDC, CC — already embody controlled vocabularies.

4. **Terminology Databases:** Used for multilingual translation and indexing (e.g., *EuroTermBank*, *TermNet*).

89. Notational Plane (Executive Plane)

Though it is the **last plane of work** in designing a classification system, the **Notational Plane** is the most **visible face** of the final product. It represents, in symbolic form, the structure of knowledge built in the **Idea** and **Verbal** planes.

Ranganathan described notation as the **"servant of the Idea Plane."**
It executes decisions taken at the conceptual level — hence, it's more accurate to call it the **Executive Plane.**

Analogy:

- In a movie:
    - Story & plot → *Idea Plane*
    - Screenplay & dialogue → *Verbal Plane*
    - Actors → *Notational Plane*

Just as good acting can't fix a bad story, a perfect notation cannot rescue a poor classification design.

89.1 Definition

1. **Notation:**
    - A system of **shorthand symbols or codes** to represent subjects and their subdivisions.
    - Each symbol (called a **digit**) has **ordinal** value — meaning it only shows **order**, not quantity.

Examples:

- In numbers: 1, 2, 3 — 2 doesn't mean greater than 1, only that it comes after it.
- In letters: A, B, C — C isn't "heavier" than B, just follows it.

2. **Purpose:**
    - To denote **classes, subjects, and aspects** of documents.
    - Forms the **call number** — the unique symbolic address of each document.

89.2 Need and Purpose of Notation

1. **Names are too long:**
    - Subject names in verbal form are cumbersome for labeling or shelving.
    - Example: *"Bibliographic Control in Digital Libraries"* can't appear in full on a spine label — it's better expressed as **025.3:004.9** (DDC/UDC).
2. **Multilingual collections:**
    - The same subject appears under different names in different languages.
    - Example: "Mathematics" in English = "Ganit" in Hindi.
        - Which shelf should it occupy — M or G?

        - A notation (e.g., **510**) solves this problem universally.

3. **Synonyms problem:**
    - Different words, same meaning.
    - *Wages*, *salary*, *pay* — all refer to the same concept.
    - A single notation avoids scattering under multiple words.
4. **Name changes:**
    - Terminology evolves over time.
    - *Political Economy → Economics*
    - *Ceylon → Sri Lanka*
    - *Education Ministry → Ministry of Human Resource Development*
    - Notation remains stable despite these changes.
5. **Avoiding subject scattering:**
    - If arranged alphabetically:
        - *Mathematics* under M
        - *Algebra* under A
        - *Geometry* under G
        - *Trigonometry* under T
    - This breaks logical unity.
    - Notation keeps them together:
        - **510 Mathematics**
        - **512 Algebra**
        - **513 Arithmetic**
        - **514 Geometry**
6. **Maintaining logical order:**
    - Words can only be arranged alphabetically, not conceptually.
    - Notation preserves the **hierarchical and sequential order** built in the idea plane.

Example:
In Botany, arrangement decided by spatial order (bottom to top):

- Plant – I
- Root – I.3
- Stem – I.4
- Leaf – I.5
- Flower – I.6

- Fruit – I.7
- Seed – I.8

This order reflects both **spatial contiguity** and **chronological growth**, preserved through numbers.

89.3 Other Uses of Notation

1. **Essential to Library Classification:**
   - Knowledge classifications (like encyclopedias) may not need notation, but **library classification** cannot function without it.
2. **Provides a document's address:**
   - Notation acts as the **shelf mark** — a fixed, mechanical locator for each document.
   - Example: *025.4 RAN* → third shelf, subject "Cataloguing."
3. **Controls catalogue and shelf arrangement:**
   - Used in classified catalogues, shelf lists, and inventory systems.
   - Ensures that every document can be located, replaced, and related mechanically.
4. **Shows subject relationships:**
   - Through hierarchical structure (e.g., 510 → 512 → 512.9), notation visually expresses relationships between broader and narrower subjects.
5. **Aids synthesis of complex subjects:**
   - Punctuation marks (+, :, /, []) in UDC and CC allow compound subjects.
   - Example:
     - **2:5** = Religion and Science (relation)
     - ** ** = Journal of Science and Technology.
6. **Facilitates Indexing:**
   - Each notation becomes a **reference point** in the index for locating terms quickly.
7. **Transparency in Faceted Classification:**
   - In faceted systems like CC, notation reflects the internal structure of subjects clearly (e.g., PMEST order).
8. **Essential for Chain Indexing:**
   - Each link in a chain derives directly from notation.
   - Example: *536.7 Heat → 536.73 Thermodynamics → 536.73:621.1 Heat Engines.*
9. **Circulation Control:**
   - Call numbers (notation + book number) are used to manage issue and return records mechanically.
10. **Operational Engine:**

- Ranganathan: *"Notation is the engine of classification."*

- Philips: *"If classification is the foundation of librarianship, notation is the basis of practical book classification."*

89.4 Additional Examples

- **Simple Notations:**
  - DDC uses pure numerical notation: 000–999.
  - Example:
    - 300 Social Sciences
    - 330 Economics
    - 332 Financial Economics
- **Mixed Notations:**
  - LCC uses letters + numbers:
    - Q = Science
    - QA = Mathematics
    - QA76 = Computer Science
    - QA76.73 = Programming languages
- **Highly Mixed Notations:**
  - UDC or CC use letters, numbers, and punctuation marks:
    - Example: *004.421.2:519.17* (Algorithms and Graph Theory)
- **Faceted Structure Example (Colon Classification):**
  - 2 Religion
  - 2;5 Religion in relation to Science
  - 2,43 Hinduism (by space)
  - 2,43;5 Religion and Science (India)

90. Canons of Notation — list

1. Canon of Homonyms & Synonyms
2. Canon of Relativity & Uniformity
3. Canon of Hierarchy
4. Canon of Mixed Notation
5. Canon of Faceted Notation
6. Canon of Co-extensiveness

91. Canon of Homonyms & Synonyms — (one-to-one ideal)

- Rule: a class-number ↔ one subject, and one subject ↔ one class-number.
- Reality: ideal rarely attainable; class-numbers usually cover small subject groups.

- Practical issues & extra examples:
    - One number for many languages: **491.44 = Bengali**, **491.49 = other Indian languages (Awadhi, Bagheli, Pahari…)** → many tongues share one number.
    - Rider's IC (3-letter codes) → high risk of homonyms (same code for unrelated topics).
    - DDC: **610 = Medical sciences**, **611 = Human anatomy** — good one-to-one in places; elsewhere one number must cover several related topics.
- Guidance: aim for minimal ambiguity but accept pragmatic grouping where full separation is impossible.

92. Canon of Relativity & Uniformity — (length expresses specificity)

- Rule: length of notation reflects depth (intension) and breadth (extension). Longer = more specific.
- Example sequence:
    - **02** Library Science
    - **025** Library Operations
    - **025.3** Bibliographic analysis & control
    - **025.3222** Authority files
- Counter-examples: systems that keep equal digit lengths for different depths (e.g., NLM: **FAI**, **FE5**, **FG9**) — order preserved, notation length not expressive.
- Practical note: expressive notation is useful but must be balanced against brevity.

93. Canon of Hierarchy — (every characteristic should appear in notation)

- Rule: each successive characteristic used in division ideally should be represented by a digit/slot.
- Example ideal:
    - **5** Sciences → **51** Mathematics → **516** Geometry → **516.352** Theory of curves.
- Violation example: Indian history → **954** (India), **954.02** (Mughal History), with same notation for "Akbar" and "Court of Akbar" → hierarchy not fully encoded.
- Practical trade-off: full hierarchical encoding increases length; libraries often stop encoding beyond practical depth.

94. Canon of Mixed Notation — (usefulness of mixed digits)

- Distinction: **Pure notation** (only numbers OR only letters) vs **Mixed notation** (letters+numbers+punctuation).
- Pros of mixed: larger base → shorter class-numbers, more capacity (e.g., LCC, BC-2).
- Cons of extreme mixing: user confusion, printing/typing inconvenience (CC's many symbol types made adoption harder).
- Examples:
    - DDC = pure numeric (decimal) → simple but can become lengthy.
    - LCC = A–Z + numbers → moderately mixed, compact and readable.

    - UDC = numerals + punctuation (+ : / [ ]) → powerful synthesis but harder to render & sort.
- Recommendation: **moderately mixed** notation often best — capacity without needless cryptic symbols.

95. Decimal vs Arithmetical Use of Numerals

- Two practices: treat numerals as **decimal fractions** (DDC, UDC, CC) or **arithmetic numbers** (LCC uses integers).
- Decimal fractions: naturally hierarchical, allow infinite hospitality at chain end (e.g., **328.33455 → 328.334552**).
- Arithmetical use: compact class labels but less direct for infilling between siblings.

96. Canon of Faceted Notation — (structural transparency)

- Rule: notation should reflect facet structure (make facets visible in the code).
- Examples:
    - UDC: **82 Shak-2** → 8 (literature) + 2 (English) + Shak (Shakespeare) + -2 (drama). Transparent facets.
    - DDC: **822.33** → structured but less transparent at glance (hierarchy present, facets implicit).
    - CC: O111.2J64H → facets are explicit and readable by structure.
- Benefit: faceted notation helps synthesis and machine parsing.

97. Canon of Co-extensiveness — (represent every aspect in notation)

- Rule: each significant characteristic of the subject should be encoded.
- Violation examples:
    - **954** / **954.02** (Indian/Mughal) but Akbar and his court share same number → not co-extensive.
    - Rider's **UJK** used for many gastric disorders → same code for different intension levels.
- Debate: exhaustive co-extensiveness makes notation long; some experts (Bliss vs Ranganathan) dispute optimal granularity. Practical compromise required.

98. Qualities of Good Notation — categories & practical points

- Categories: (a) Optional/desirable; (b) Essential/vital; (c) Scientific.
- Core practical qualities (prioritise these):
    1. **User-friendly** (easy to read, write, type).
    2. **Brief** (spine/label constraints in print libraries).
    3. **Moderately mixed & familiar digits** (balance capacity and usability).
    4. **Expressive where useful** (shows hierarchy up to a practical depth).
    5. **Mnemonic** (helps recall; optional but helpful).
    6. **Computer-friendly** (no exotic punctuation that breaks ASCII sorting).

- Examples: DDC = brief, mnemonic (schedule), decimal → popular; CC = expressive & mnemonic but highly mixed → adoption issues.

99. How to achieve brevity

- **Proportionate digit allocation:** allocate fewer digits to stable, large domains (philosophy, religion) and more to dynamic fields (computer science, biotech).
- **Wider base (mixed notation):** mixing letters and numbers increases address space → shorter strings.
- **Broader grouping:** tolerate some breadth in classes to keep numbers short (practical trade-off).

100. Mnemonically Based Notation — three kinds

1. **Alphabetical (literal) mnemonic:** initial letters used (LCC: A, AC, AE; literal G = Geography).
    - Example: **QA** = Mathematics in LCC.
2. **Scheduled mnemonic:** recurring concepts share same digit across classes (DDC: language digits).
    - Example: English language/literature/history often have a recurring "2" component in certain schemes.
3. **Seminal mnemonic (Ranganathan):** assign semantic meaning to digits (1 → unity/God; 2 → plane/form; 3 → space/function; etc.).
    - Example: digit **5** for energy/light/organic concepts in CC.

- Caution: mnemonics that conflict with helpful sequence should not distort user-helpful order.

101. Hospitality — the single most vital notation quality

- Definition: ability to accommodate new subjects at correct places without disturbing existing structure.
- Two levels:
    1. **Hospitality by classifiers** (local, ad-hoc synthesis).
    2. **Hospitality by classificationists** (systemic: new editions / scheduled expansion).

102. Hospitality by classifiers — synthesis devices (Ranganathan)

- Devices classifiers may use to create new numbers locally:
    1. **Subject device** (combine existing facets)
    2. **Chronological device** (add time facet)
    3. **Geographical device** (add place facet)
    4. **Super-imposition device** (overlay form/subject)
    5. **Alphabetical device** (use author/title initials)
- Practical example: if no number for "CD-based bibliographies", classifier might synthesize **025.3:[CD]** or use local extension until formal revision.

103. Hospitality by classificationists (system designers)

- Planned mechanisms for growth:

    - **Gaps in arrays** (leave vacant positions).
    - **Sectorising digits** (reserved digits Z/9/0 to extend arrays).
    - **Emptying digits** (make new slots that are semantically empty but ordinally placed).
    - **Empty-emptying digits** (further interpolation layers).
- These are structural tools to keep schedules expandable without wholesale renumbering.

104. Gap Device — (vacant slots)

- Practice: intentionally leave empty positions in an array to fill later.
- Example (CC): U1, U2, **U3 [vacant]**, U4 … → U3 fills a future topic.
- Limitations: often insufficient where rapid emergence occurs (e.g., tech); vacant slots may be wrongly used elsewhere causing misplacement.

105. Sectorising Digits (interpolation using "empty" digits)

- Technique: reserve special digits (e.g., 0, 9, z, Z) that carry **no semantic value** but allow extension.
- Mechanism: create chains like 1,2,…8, 91,92…99, 991,992…999 to expand coordinate classes.
- Example use: DDC uses the concept of "9 — other" and decimal chaining; CC uses Z to multiply coordinate space.
- Caution: too many interpolated slots → long numbers and management overhead.

106. Emptying Digits

- Idea: a digit that *empties* the semantic value of a preceding digit while keeping order — to insert a new coordinate subject between siblings.
- Example: K (Zoology), L (Medicine). Want "Animal Husbandry" between them → assign **KX** (X = emptying digit) to Animal Husbandry. K no longer purely equals Zoology in that position.
- Benefit: insert without renumbering full array.
- Risk: can blur original semantic mapping of digits.

107. Empty-Emptying Digits (further interpolation)

- Ranganathan's extension: digits (U, W, Y) that not only are empty but make other digits empty, allowing near-unlimited interpolation (e.g., **YYT, YYU**).
- Powerful but increases complexity and cognitive load for human users.

108. Gaps & Sectorising — practical illustration

- **Array with gaps:** U1 Physical Geo, U2 Human Geo, U3 [vacant], U4 Political Geo… → fill U3 later with new subfield.
- **Sectorising example:** 1,2,3…8, 91,92… → add 91 as a coordinate after 8 without renumbering earlier items.
- **Emptying example:** 44 India → 44T Nepal, 44V Sri Lanka, 44X Pakistan (inserted between 44 and 45 Iran).

109. Hospitality in Chains — decimal chaining

- Decimal fractions allow inserting new subclasses at chain end: e.g.,
    - **328** Legislative process
    - **328.3** Parliaments
    - **328.33455** Gerrymandering
    - **328.334552** Reserve constituency (new insertion)
- Advantage: fine-grained growth without renumbering entire sequence.

110. Problems & Practical Limits of Notation

- **Complexity vs Usability:** highly mixed or symbol-heavy notation confuses lay users. Example: CC's many symbol types hinder widespread adoption.
- **Lengthy class-numbers:** hard to print on spines; hard to remember; cumbersome in manual libraries.
- **Poor machine compatibility:** exotic punctuation in UDC complicates ASCII sorting & early computer handling.
- **Overloading notation:** expecting notation to do too much (perfect one-to-one, full semantics, mnemonic, brevity) leads to trade-offs.
- **Misplacement due to lack of gaps:** DDC's compressed technology classes sometimes force new topics into nearby but semantically distant slots.
- **Human factors:** users often treat notation as the whole classification and may be bewildered by cryptic codes.
- **Management cost:** very granular, highly expressive notations demand continuous editorial maintenance (resource issue).

111. Practical recommendations (implementation-focused, pointwise)

- Prefer **moderately mixed** notation (letters+numbers) for compactness and readability.
- Use **decimal chaining** for chain hospitality; use **sectorising/emptying** sparingly and document conventions.
- Reserve **simple, ASCII-friendly punctuation** if using punctuation at all (helps automation).
- Balance **expressiveness** with **brevity**: show hierarchy up to practical depth only.
- Maintain strong **documentation**: rules for local synthesis, empty digits, and book-numbering must be explicit for classifiers.
- Train staff and provide user help so notation remains an aid, not a barrier.

112. Subjects and disciplines: Modes of formation of subjects

Definition:
Knowledge is the **sum of ideas, experiences, and values** conserved and transmitted by society. It exists in sciences, arts, religion, literature, facts, and myths — in all human expressions.

- Society acts as the **conservator of knowledge**.
- Knowledge is **knower-dependent** — it exists only when perceived by a human mind.

- It is both **created and consumed** by humans to solve problems and improve life systems.

Examples:

- Scientific discoveries (e.g., gravity, evolution) created to understand the world.
- Cultural knowledge like folk medicine or oral traditions preserved by communities.

113. Characteristics of Knowledge

1. **Knower-Dependent:**
    - Exists only in the mind of the knower.
    - It is **subjective**, not independent.
    - Example: A mountain exists materially, but knowledge *about* the mountain is mental.
2. **Social in Nature:**
    - Conserved and transmitted by society through communication and institutions.
    - Example: Schools, libraries, oral traditions preserve collective knowledge.
3. **Incomplete and Dynamic:**
    - Knowledge is **never final**. It evolves continually.
    - Example: Old physics (Newtonian) refined by modern quantum theory.
4. **Infinite / Inexhaustible:**
    - It expands endlessly with time and discovery.
    - Example: Space research keeps uncovering new galaxies and theories.
5. **Mutual Dependence:**
    - Technology, society, and knowledge creation depend on one another.
    - Example: Computers arose from knowledge and now generate new knowledge themselves.
6. **Environmental Origin:**
    - Both **physical nature** and **social interaction** stimulate knowledge creation.
    - Example: Observation of seasons → agricultural knowledge; observation of society → sociology.

114. Knowledge Generation and Use

- Knowledge originates when humans interact with their environment using **sense organs**.
- Perceived information combines with existing mental stock → forms *new knowledge*.
- It is **socio-biological** — depends on biological perception and social context.
- Society and knowledge are **mutually dependent**:
    - Society creates and directs knowledge.
    - Knowledge reshapes and advances society.

Examples:

- Discovery of electricity → led to technological and social revolutions.
- Society's needs (like health or transport) direct where research funds go.

115. Importance of Knowledge Studies for Librarians

1. Librarians deal with **recorded knowledge** (documents).
2. Understanding the **nature and structure** of knowledge helps in:
    - Collection building
    - Organization and classification
    - Information retrieval
    - Preservation and dissemination
3. Jesse Shera compared this to **anatomy for surgeons** — essential professional understanding.

Examples:

- Recognizing how knowledge evolves helps design better classification schemes.
- Understanding interdisciplinary areas aids cataloguing of hybrid subjects like bioinformatics.

116. Growth of Knowledge

Knowledge grows like a **living organism** — constantly changing, expanding, and refining.

1. **Additive Growth:**
    - Common in arts and humanities; each work adds unique contribution.
2. **Cumulative Growth:**
    - Seen in sciences where new knowledge builds upon earlier discoveries.
3. **Unplanned (Natural) Growth:**
    - Driven by curiosity, creativity, and exploration.
    - Example: Discovery of fire, invention of wheel, exploration of DNA.

Ranganathan's Fifth Law — "Library is a growing organism" — mirrors this truth.

Examples of growth rate:

- Scientific literature grows 5–15% annually.
- Human-generated data (per Google's estimate) now doubles every few years.

117. Reasons for Continuous Growth

1. **Human Curiosity and Exploration:**
    - The urge to know the unknown keeps generating new knowledge.
2. **Fragmentary Nature:**
    - Every research answer opens more questions.

- Example: Atomic theory → led to particle physics → quantum mechanics.

3. **Social and Technological Progress:**
    - Economic, cultural, and political development depend on new knowledge.
4. **Self-Sustaining Cycle:**
    - Knowledge feeds its own expansion — new knowledge requires old knowledge to grow.

118. Planned Growth

- Knowledge creation is now **organized and funded** for economic and social advancement.
- Knowledge is treated as **capital** — a key national resource.

Examples:

- National Knowledge Commission (India, 2005–2008).
- UNESCO programs for global knowledge access.
- Government-funded R&D in renewable energy, health, education.

Importance:

- Research → Innovation → Economic Growth → Better Quality of Life.
- Education and research policies ensure continuous, strategic knowledge expansion.

119. Induced Growth

- Knowledge multiplies through **sharing, teaching, and communication**.
- The more it is used, the more it expands.

Factors inducing growth:

- Universal education and digital technology.
- Team research and collaboration.
- Government and corporate funding.
- "Publish or perish" culture.
- Information networks, libraries, and databases.

Example:

- Cold War research (after Sputnik) accelerated developments in space, defense, and computing.

120. Modes of Knowledge Growth

Knowledge grows through **three main modes** (Ranganathan):

1. **Specialization**
2. **Interdisciplinary Growth**
3. **Multidisciplinary Growth**

Each mode reflects a different pattern in the formation of subjects.

121. Growth by Specialization

- As a field grows vast, it divides into **narrower subfields** to study details deeply.
- A specialist knows **more and more about less and less**.
- Example:
    - Science → Physics → Nuclear Physics → Quantum Physics → Particle Physics.

a) Fission

- Repeated splitting of a subject into smaller fragments.
- Example: Physics → Mechanics, Heat, Light, Sound, Electricity.

b) Dissection

- One-time division into coequal branches.
- Example: Earth → Continents; Medicine → Anatomy, Physiology, Pathology.

c) Denudation

- Repeated dissection of one branch → deeper levels of detail.
- Example: Chemistry → Organic Chemistry → Hydrocarbons → Aromatics → Benzene.

d) Lamination

- Qualifying a basic subject with one or more topics (compound subjects).
- Example:
    - Linguistics → English Linguistics → English Grammar → Teaching of English Grammar.
    - Botany → Plant Anatomy → Leaf Anatomy of Mango.

122. Interdisciplinary Growth

- Occurs when scholars from **different disciplines collaborate** to solve common problems.
- Leads to **cross-breeding of ideas** and **new hybrid subjects**.

a) Loose Assemblage

- Temporary combination of subjects; reversible.
- Example: *Psychology for Nurses*, *Statistics for Librarians*, *Impact of Computers on Education.*

b) Fusion

- Permanent combination creating a **new, independent subject.**
- Example: *Biophysics, Biochemistry, Geopolitics, Chemical Physics.*

123. Multidisciplinary Growth

- Arises when multiple fields contribute to a **common theme or mission**.
- Usually area-oriented, team-based, and applied.

a) Distillation

- A common method or tool becomes a new subject through wide use.
- Example: *Management Science, Research Methodology, Museology, Semantics.*

b) Partial Comprehension / Agglomerates

- Combination of several related disciplines under one broad heading.
- Example: *Social Sciences, Life Sciences, Humanities.*

c) Subject Bundles / Clusters

- Cooperative research across several fields toward one goal.
- Example: *Environmental Studies, Defence Science, Oceanography, Indology.*

124. Some New Modes of Growth

a) Procreation

- A subject born from union of two older ones.
- Example: *Linguistics* (from Philosophy + Philology) → *Psycholinguistics, Sociolinguistics.*

b) Self-Procreation

- Subject generates applied branches of itself.
- Example: *Applied Physics, Applied Mathematics, Applied Chemistry.*

c) Analogical Mode

- One discipline borrows ideas from another by analogy.
- Example: *Social Darwinism, Political Dynamics, Sociobiology.*

d) Instrument-Based Mode

- Subject develops around an instrument or technology.
- Example: *Microscopy → Microbiology, Computer → Computer Science → AI.*

e) Annexation Mode

- A discipline expands by absorbing nearby fields.
- Example: *Geography* → Political, Medical, and Economic Geography; *Physical Education* → Sports Science, Biomechanics, Psychology.

125. Relevance and Use

- Modes of formation of subjects reveal **relationships among ideas** and help librarians:
    - Understand how disciplines evolve.
    - Classify interdisciplinary works accurately.
    - Plan for **hospitality** in classification schemes.
- Essential for designing modern library classifications that can handle **cross-disciplinary and evolving knowledge structures**.

Examples:

- LIS adopting interdisciplinary cataloguing for hybrid fields like *Bioinformatics* or *Digital Humanities.*
- DDC and UDC revisions to include emerging fields such as *Nanotechnology* and *Data Science.*

126. Kinds of Subjects — overview

- Universe of knowledge is layered: disciplines → main classes → categories → facets → isolates.
- Ranganathan's three kinds: **Basic**, **Compound**, **Complex**.
- A *subject* gives context/focus to a topic or isolate.

127. Basic Subjects (definition & features)

1. Subject without isolates — a **main class**.
2. Postulated *a priori* by the scheme; coherent field of study.
3. Number constrained by social/academic factors and notation.
4. Changeable across editions (examples: CC 6th → <100; CC 7th → >700; DDC → 10 main classes).

Examples:

- Physics, History, Economics (basic in many schemes).
- Geopolitics: complex → later promoted to a basic subject in CC.

128. Ten kinds of Basic Subjects (compact list — Ranganathan's typology)

1. Primary basic subjects
2. Non-primary basic subjects
3. Disciplinary subjects
4. Interdisciplinary subjects
5. Multidisciplinary subjects
6. Distilled subjects (technique-based)
7. Composite subjects
8. Partial-comprehensive subjects
9. Clustered / mission-oriented subjects
10. Procreated / self-procreated subjects

Quick examples: distilled = *Research Methodology*; clustered = *Ocean Science*; procreated = *Applied Physics*.

129. Compound Subjects (definition & formation)

1. Composed of a **basic subject + one or more isolates (facets)**.
2. Enumerative schemes list them; faceted schemes synthesize them.
3. Infinite in number (in principle).

Examples:

- *Eye Medicine*, *Eye Diseases*, *Treatment of Eye Diseases*.
- *Indian Political History*, *Modern English Drama*.

130. Complex Subjects (definition & nature)

1. Subjects combining **two or more main/compound subjects** (interdisciplinary).
2. Formed by **phase relations** (Ranganathan's term).
3. Phases are detachable; complex subjects may later become basic.

Examples:

- *Mathematics for Engineers* (bias)
- *Influence of Geography on History* (influencing)
- *Science and Religion* (general)

131. Facets vs Phases — concise contrast

- **Facets:** intrinsic constituents of a compound subject; need facet analysis.
    - Example: *Treatment* is a facet of *Eye Diseases*.
- **Phases:** loosely assembled, often interdisciplinary components; need phase analysis.
    - Example: *Religion* and *Politics* in *Influence of Religion on Politics*.

132. Six kinds of Phase Relations (Ranganathan)

1. **General** — unspecified relation. (e.g., Science & Religion)
2. **Bias** — subject presented for a specific user/group. (e.g., Mathematics for Engineers)
3. **Comparison** — comparative study. (e.g., Indian vs British Constitutions)
4. **Difference** — emphasis on differences. (e.g., Hinduism vs Jainism)
5. **Tool** — one subject used as method/tool. (e.g., Mathematical Economics)
6. **Influencing** — one subject influences another. (e.g., Impact of IT on Libraries)

133. Three Levels of Relations (where phases occur)

1. **Phase relation** — phases belong to different main classes.
    - e.g., *Science and Religion*.
2. **Intra-facet relation** — same main class, different arrays/facets.
    - e.g., *Influence of Transport on Trade* (both in Economics facet).
3. **Intra-array relation** — same facet, same array (equal rank isolates).
    - e.g., *Comparison of English and French pronunciation*.

134. Phase-analysis: choosing primary & secondary phases (rules)

- **Symmetrical relations** (General, Comparison, Difference): primary = phase with **lesser ordinal value** (appears earlier in schedule).

    - Example: *Chemistry & Physics* → Physics (Primary) if Physics occurs earlier.
- **Asymmetrical relations** (Bias, Tool, Influencing): rules depend on role:
    - **Bias:** biased (donor) subject = **Primary** (Math for Engineers → Math primary).
    - **Tool:** studied subject = **Primary** (Mathematical Biology → Biology primary).
    - **Influencing: influenced** subject = **Primary** (Influence of Bhagavad-Gita on Hindi literature → Hindi lit primary).

135. Constructing complex class-numbers (CC formula — compact)

- Pattern: **Phase I + 0 + relation-symbol (roman small) + Phase II**
- Remove common digits between phases when concatenating.

Short examples (notation-style):

- Language & Literature: O0aP (general)
- Mathematics for Engineers: B0bD (bias)
- Influence of Mathematics on Physics: C0gB (influencing)

136. Multi-phased / Poly-phased subjects

- More than two phases possible (order 2, 3, ...).
- Rare in CC schedules but theoretically allowed.
- Example idea: *Impact of Technology, Policy and Culture on Urban Education* — tri-phased.

137. How other major systems handle phase relations — short survey

- **LCC (Library of Congress):** enumeration; uses headings like *General Special* for relations (prone to ambiguity).
    - Example: *Socialism and Women* → HX546.
- **DDC (Dewey):** limited; uses standard subdivisions (e.g., -024 for works for specific users); historically experimented with relation notation but is largely enumerative.
    - Example: 510.2462 = Mathematics for engineers.
- **UDC (Universal Decimal):** colon : for relations (flexible but non-specific).
    - Example: 52:62 = Mathematics for Engineers.
- **BC-2 (Bibliographic Classification 2):** reserved digits (e.g., 9x) for synthesized multiphased subjects; explicit relation codes (more systematic).

138. Practical examples (many, bite-sized)

- **Bias (where donor is primary):** *Psychology for Teachers* → classify under Psychology.
- **Tool:** *Statistics in Biology* → classify under Biology (statistics as tool).
- **Influencing:** *Influence of Colonial Law on Modern Constitutions* → classify under Constitutions (influenced).

- **Comparison (symmetrical):** *Comparison of Indian & British Education* → primary = earlier-scheduled subject (use schedule order).
- **Intra-array difference:** *Difference between Male and Female Curricula* → both isolates in same array; code uses intra-array indicator.

139. Advantages of explicit phase treatment (why bother)

- Enables **systematic classification** of interdisciplinary works.
- Preserves **discipline coherence** while offering **hospitality** to hybrid topics.
- Supports **consistent synthesis rules** for classifiers and machine indexing.
- Reduces arbitrary placement and improves retrieval for multi-focus works.

140. Practical cautions & librarian's heuristics

- If user-centered placement (where the book will be used most) conflicts with discipline-based rules, **document both choices** (local notes or cross-references).
- Use **phase rules** when subject focus is clear; avoid forced multiphase encoding when literary warrant is weak.
- When in doubt, follow **literary warrant**: let published literature guide phase treatment and preferred placement.

141. Knowledge — concise definition
Knowledge = sum of recorded ideas, facts, fiction, myths, experiences and expressed emotions conserved by society.

- Public, social, knower-dependent.
- Libraries handle **recorded** portion (documents, media).

142. Why knowledge matters to librarians (4 quick points)

1. It's the library's stock-in-trade — collecting & preserving it is core work.
2. Organizing knowledge = making a usable map for users.
3. Knowing how knowledge grows & shifts guides classification and acquisitions.
4. Helps decide shelving, indexing, subject access, and long-term preservation.

143. Mapping the universe of knowledge — short statement

- Knowledge is dynamic: new subjects emerge, boundaries shift, status of fields changes.
- No universal, permanent map fits all times/cultures; classification must be adaptable.

144. Key drivers that change subject status (compact list)

- Prevailing philosophy/ideology
- Material culture & economy
- Technological needs (e.g., IT, biotech)
- Institutional priorities (universities, funders)
- Publishing trends and literary warrant

145. Example — historical shift (one line)

- Middle Ages: theology central → modern era: natural sciences dominant → today: IT/biotech/environment highly ranked.

146. Classifications are impermanent — core points

- As knowledge changes, classifications must be **revised or redesigned**.
- Example: subjects that were compound/complex in one edition may become basic in a later edition (e.g., geopolitics in CC).
- Practical consequence: allow **hospitality** and revision machinery in a scheme.

147. Four principles for mapping knowledge (D.W. Langridge) — table

Principle	What it means	Quick example
Ideological	Map follows an ideology or worldview	BBK centring Marxism-Leninism
Social purpose	Arrange by current social utility	Vedic Dharm/Arth/Kam/Moksh ordering
Scientific order	Order by natural/logical evolution	Cutter's evolutionary order; taxonomies in biology
Discipline arrangement	Divide by academic discipline	Melvil Dewey's discipline-based DDC

148. Ideological principle — tip

- Every scheme reflects cultural/time bias; none is value-free.
- Librarians must be aware of origin bias when adapting a scheme.

149. Principle of social purpose — one line

- Maps knowledge by social priorities (useful where libraries serve mission-driven institutions).

150. Scientific / evolutionary ordering — brief

- Orders subjects by natural/integrative levels (atomic → molecular → organism → society).
- Works well for natural sciences; metaphorical for social fields.

151. Discipline arrangement (Dewey's legacy)

- Discipline = organized field with similar methods/objects.
- Most general classifications use discipline as first split (DDC, LCC).

152. Comparative table — how major schemes map knowledge (compact)

Scheme	Primary mapping principle	Notation type	Notable strength
DDC	Discipline (inverted Baconian)	Decimal numeric	Hierarchical + chain hospitality (decimals)
UDC	Discipline + facet synthesis	Decimal + punctuation	Powerful synthesis (colons, +)
Cutter (Expansive)	Evolutionary / integrative levels	Alphabetic	Evolutionary order; influenced LCC

J.D. Brown	One-place theory (concrete-centred)	Numeric	Collocates a subject & aspects (failed widely)
Ranganathan (CC)	Faceted, theoretical (PMEST, APUPA)	Highly mixed symbols	Faceted synthesis, APUPA shelf learning order
LCC	Discipline, pragmatic (literary warrant)	Mixed alpha-numeric	Tailored to LC collection; pragmatic flexibility
BC / BC-2	Scientific consensus + faceting	Mixed	Stable consensus order; alternatives allowed
BBK	Ideological (Soviet), hierarchical/faceted	Cyrillic / 1/9 decimals	Integrated S&T focus; tables for auxiliaries
Rider's IC	Broad enumerative (alphabetic)	Alpha (3 letters)	Very broad; low revision needs (but unused)

153. DDC — compact pros & cons

- Pros: simple decimal chaining, excellent hospitality in chains, powerful index.
- Cons: rigid decimal divisions can be artificial; some disciplinary splits awkward (languages vs literature).

154. Cutter & LCC — compact

- Cutter: evolutionary idea; alphabetic notation to avoid decimal rigidity.
- LCC: grown by literary warrant; pragmatic for LC collections; class order influenced by practical needs.

155. Brown's one-place theory — one line

- Collocate a concrete subject and its aspects; useful idea, but led to odd placements (practical problems).

156. Ranganathan's Colon Classification — compact

- Faceted, postulatory, PMEST citation order, APUPA shelf pattern.
- Strengths: synthesis, hospitality, learning-order on shelves.
- Weakness: complex notation, steeper learning for users.

157. BC / BC-2 & modern systems — note

- BC aims scientific consensus in main-class order; BC-2 later extended phase synthesis (9-codes).
- Modern schemes try to handle interdisciplinarity better.

158. BBK / BSO (and socialist systems)

- Map knowledge reflecting national ideology and social priorities; strong S&T emphasis in some versions.

159. Practical checklist for librarians when mapping knowledge locally (table)

Task	Question to ask	Action
Choose scheme	Which scheme fits institutional mission?	Prefer scheme aligning with collection & users
Accommodation	Can the scheme absorb new topics?	Use faceting, gap devices, or local synthesis rules

Bias detection	Does the scheme reflect ideology?	Add local notes or cross-references if needed
User orientation	Will users find items where they expect?	If needed, add user-guides, signage, or local arrangement
Revision plan	Is there a plan to update classifications?	Schedule periodic reviews & subscribe to updates

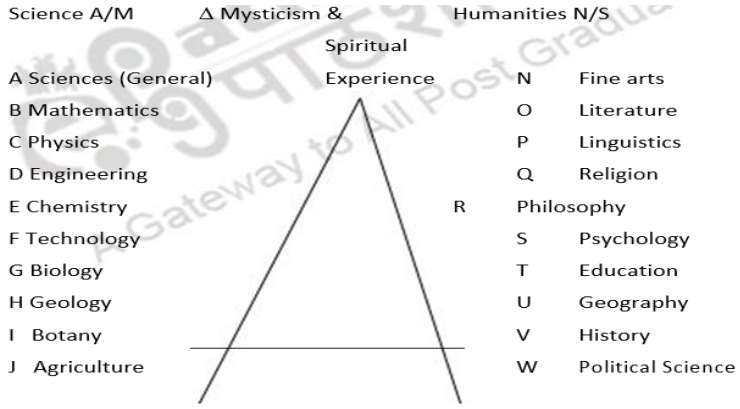
160. Mapping implications for classification design (point form)

- Build **hospitality** (gap slots, synthesis rules).
- Keep **revision machinery** and governance ready.
- Provide **local guidance** (cross-references, signage) when scheme choices diverge from user expectations.
- Document all local syntheses and exceptions.

161. One-line advice on user vs discipline placement

- Discipline-based placement preserves intellectual mapping; user-oriented placement improves immediate usability — document crosswalks so you get both.

162. Visual (inline) — simple "triangle" for Ranganathan's main-class logic (text chart)



Source E-Adhyayan Books

- Interpretation: sciences → humanities → social sciences; D at crossroad.

163. Quick guide: when to pick faceted vs enumerative scheme

- **Faceted** (UDC, CC, BC-2): choose when collection is interdisciplinary, fast-growing, needs synthesis.
- **Enumerative** (DDC, LCC): choose when ease of use, simplicity, and stable broad classes matter.

164. Examples of classification adaptation in practice

- Local library groups put 400 (Languages) next to 800 (Literatures) for patron convenience (local variation).
- University with strong biotech programs creates local syntheses for bioinformatics until the scheme adds formal numbers.

165. Short table — Indicators librarians need to watch (signals of change in knowledge)

Indicator	What it signals
Spike in publications on a theme	Emerging subject → plan new syntheses
Interdisciplinary journal launches	Need for phase/compound handling
Funded national initiatives	Subjects likely to become basic (planned growth)
User reference queries clustering	User demand indicates local reclassification needs

166. Actionable next steps (three bullets)

- Keep a **change-log** for all local syntheses and cross-references.
- Train staff on **phase/facet rules** used in your scheme.
- Monitor literature & publisher trends for **literary warrant** of new subjects.

167. Tiny glossary (3 items)

- **Hospitality:** ability of a scheme to accept new topics without disruption.
- **Literary warrant:** published literature that justifies creating or changing a class.
- **Phase vs Facet:** phase = loosely assembled interdisciplinary component; facet = intrinsic component of a compound subject.

168. Practical mini example (table) — handling an emerging subject: "Data Science"

Option	Where to place	Pros	Cons
With Computer Science (CS)	under CS	tech users find it	misses statistical & domain aspects
With Statistics/Math	under Math/Stats	method focus	misses application angle
Create cross-reference + synthesis entry (e.g., CS:ST)	hybrid	best retrieval across users	requires documented synthesis rules

169. One-sentence closing nudge

Classify for **both** the intellectual map and the user's path — keep the map honest and the path obvious.

170. Ready-to-use deliverable offer (one line)

I can convert this into a printable one-page cheat-sheet or a two-column quick-reference table for your team — tell me which format you want and I'll lay it out.

171. Dewey — flash of origin (one line)

Melvil Dewey (1851–1931) conceived the idea of decimal-based subject numbering in 1873 while at Amherst College; first DDC pamphlet appeared in 1876.

172. Significance

- Foundation of modern library classification.
- Introduced three key ideas: **discipline-based arrangement**, **decimal hierarchical notation**, and **relative index**.
- Remains the most widely used system worldwide — adopted in nearly **2 lakh libraries** across 135 countries, translated into 30+ major languages, and integrated into **WorldCat/OCLC** and online knowledge systems.

173. Historical milestones

Year	Edition / Event	Notes
1876	1st Edition (44 pages)	"A Classification and Subject Index…" published anonymously
1885	2nd Edition	Expanded to seven times original size
1942	14th Edition	Became very bulky
1951	15th Edition	Over-trimmed; proved unsuccessful
1958	16th Edition	Issued in two volumes (Editor: B.A. Custer)
1971	18th Edition	First three-volume issue
2011	23rd Edition	Four volumes, edited by Joan S. Mitchell (OCLC)

174. Basic Plan and Structure

- A **general classification system** aiming to arrange all fields of knowledge.
- Based on **Francis Bacon's three faculties of mind**: *Memory*, *Imagination*, and *Reason*.
- Organizes subjects by **discipline**, not by specific topic.

175. The three grand divisions (Baconian base)

Faculty of Mind	Corresponding Discipline	DDC Range
Memory	History, Geography	900s
Imagination	Arts & Literature	700–800s
Reason	Sciences	100–600s

176. The Ten Main Classes (First Summary)

Class No.	Subject Area
000	Generalia (Knowledge, Systems, Computer Science, Bibliography)
100	Philosophy & Psychology
200	Religion
300	Social Sciences
400	Language
500	Pure Sciences
600	Technology / Applied Sciences
700	The Arts
800	Literature
900	History, Geography & Biography

177. Division of Main Classes (Second Summary)

Each main class divides decimally into **10 divisions**, making **100 divisions** total.

Example – 600 Technology (Applied Sciences):

Division	Subject Area
610	Medical Sciences
620	Engineering & Allied Operations
630	Agriculture & Related Technologies
640	Home Economics & Family Living
650	Management & Auxiliary Services

660	Chemical & Related Technologies
670	Manufactures
680	Manufacture for Specific Uses
690	Buildings

178. Sections of Divisions (Third Summary)
Each of the 100 divisions divides into **10 sections → 1,000 sections** total.

Example – 610 Medical Sciences:

Section	Subject
611	Human Anatomy, Cytology, Tissues
612	Human Physiology
613	Personal Hygiene
614	Public Health
615	Pharmacology & Therapeutics
616	Diseases
617	Surgery
618	Special Branches of Medicine
619	Experimental Medicine

179. Decimal Extension (finer subdivisions)

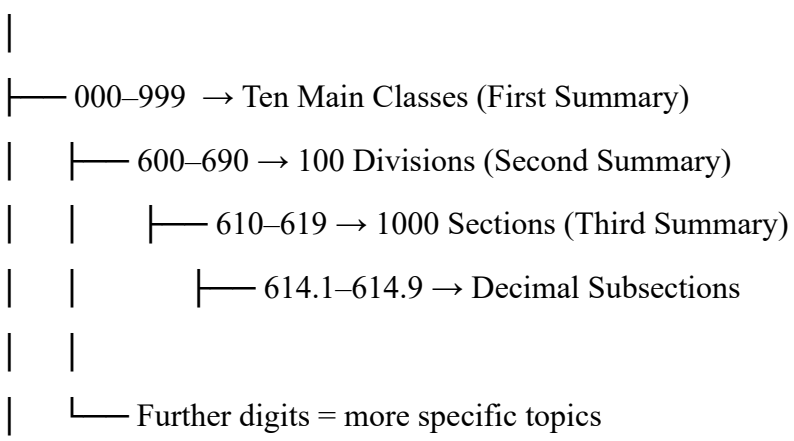
- Each section may be subdivided decimally again.
- The **dot (.)** is inserted after the third digit, not as a decimal point but to enhance readability.

Example – 614 Public Health:

Number	Subject
614.1	Forensic Medicine (Medical Jurisprudence)
614.4	Control of Diseases
614.5	Control of Specific Diseases
614.6	Disposal of the Dead

180. Hierarchical Structure Overview (text diagram)

Knowledge


000–999 → Ten Main Classes (First Summary)
600–690 → 100 Divisions (Second Summary)
610–619 → 1000 Sections (Third Summary)
614.1–614.9 → Decimal Subsections
Further digits = more specific topics

|

└── Add author/book number → complete call number

181. Features of Decimal Notation — Strengths & Limits

Feature	Advantage	Limitation
Decimal hierarchy	Infinite expansion; easy insertion	Can be rigid and artificial
Chain structure	Natural from general → specific	Forces subjects into linear order
Relative index	Cross-links scattered topics	Same topic appears under several disciplines
Universal language	Language-independent numerals	Some cultural bias in subject hierarchy

182. Classification by Discipline (Core Principle)

- Subjects are **scattered by discipline** — a topic like *Metals* may appear in Physics (530), Technology (670), or Fine Arts (730).
- Thus, DDC provides **multiple disciplinary contexts**, not a single universal class number for one idea.

183. Significance of Generalia Class (000)

- Added for **practical library needs** to hold interdisciplinary and form works (e.g., computer science, systems, bibliographies).
- Distinguishes library classification from pure knowledge taxonomies.

184. Symbolic Summary of the Decimal Framework

Summary	Divisions	Total Classes	Example
First Summary	10 Main Classes	10	600 Technology
Second Summary	10 Divisions × 10	100	620 Engineering
Third Summary	10 Sections × 100	1,000	616 Diseases
Fourth Level (Optional)	Decimal expansion	Infinite	616.1–616.9 etc.

186. DDC Chain Structure

- DDC is **hierarchical**, meaning each longer number represents a narrower, more specific topic.
- Every added digit signifies further **specialization** and **subordination** of subjects.
- This hierarchy reflects **whole-part** or **semantic relationships** among subjects.

Example (progressive specificity):

Class Number	Subject
300	Social Sciences
330	Economics
332	Financial Economics
332.1	Banks and Banking

Class Number	Subject
332.11	Central Banks
332.110954	Reserve Bank of India (RBI)

Each level inherits context from its predecessor, forming a *chain of concepts*.

187. Auxiliary Tables in DDC

These tables expand and modify class numbers from the main schedules. There are **six** tables in total:

Table No.	Table Name	Purpose / Example
T1	Standard Subdivisions	Adds common aspects like form, time, place (e.g., T1–09 for history, T1–05 for periodicals)
T2	Geographic Areas	Adds geographic locations (e.g., T2–54 India)
T3	Subdivisions for Individual Literatures	Adds form divisions (A–C) for poetry, drama, etc.
T4	Subdivisions of Languages	Adds grammatical and linguistic forms
T5	Racial, Ethnic, National Groups	Adds cultural/ethnic perspectives
T6	Languages	Lists world languages for use with linguistics or literature

Note:

- **T1** is used freely without instructions.
- **T2–T6** are used **only when specified** in the schedules.

188. DDC Notation System

- DDC uses **decimal numbers**, but omits the initial "0." and decimal point for simplicity.
- Example: *0.1 Philosophy* becomes **100**.
- A **dot (.)** is inserted **after the first three digits** for clarity, not as a mathematical decimal (e.g., **332.11** for Banks).
- Each class number must have **at least three digits**, with filler zeroes used when needed (e.g., 500 Natural Sciences, 510 Mathematics).

This notation is mathematically incorrect but highly practical for shelving and hierarchy.

189. Number Building (Synthesis in DDC)

Though DDC began as **enumerative**, it has evolved to allow **synthetic number building** using "Add to…" instructions.

Number Building Methods:

Method	Description
Add to from 001–999	Extend base numbers across schedules
Add to from designated base	Use another base number for extension
Add to from same division/section	Combine topics within same group
Add to via special provisions (04)	Use facet-like add-ons such as "General Special"
Add to from Tables 1–6	Attach standard or auxiliary table data

Example:

"Mathematics in India" → **510 (Math)** + **T2–54 (India)** = **510.54**

190. Hospitality (Definition)

- **Hospitality** = a classification's capacity to accommodate new subjects **without disturbing** the existing order.
- **Longevity** of a classification system depends directly on its **hospitality mechanisms**.

191. Hospitality in Chain

- Achieved through **hierarchical notation** that allows indefinite extension.
- A new subject can be placed simply by **adding another digit** to its parent class.
- Enables DDC to serve **all sizes of libraries** — small libraries can truncate numbers for broader topics; larger ones can extend for depth.
- In digital databases, users can **navigate hierarchically** (up/down the chain).

Example:
Adding "Reserve Bank of India" after "Central Banks" → 332.11 → **332.110954**

192. Hospitality in Array

- A **horizontal expansion** method for adding *new but related subjects* within the same level.
- Problem: Decimal notation allows only **ten slots per array (0–9)**, so gaps are intentionally **left open**.

Examples of Reserved Gaps:

- In **Mathematics (511–519)** → numbers like **517** are left vacant.
- In **Chemistry (541–549) → 544–545** remain unassigned.

Unassigned numbers are shown in **square brackets**, e.g., [136].
Leaving gaps is more **art** than **science**, offering future flexibility for new topics.

193. Hospitality Through Revisions

- Major **restructuring** is sometimes needed to add new subjects.
- Example: Revisions made in
    - **350–354 (Public Administration)**
    - **560–590 (Life Sciences)** in **DDC–21 (1996)**.
- Revisions often involve relocating subjects, merging redundant numbers, and adjusting disciplinary order.

194. Relative Index

- Integral feature of DDC — provides **alphabetical access** to all terms across schedules and tables.
- Called **"Relative"** because it brings together **distributed aspects** of a topic scattered under different disciplines.

Example:
The subject **"Child"** appears under

- Psychology (155.4)

- Education (372.21)
- Sociology (305.23)
- Literature (820.93)

→ All united under one index entry: **Child** (with respective class numbers).

- DDC–23 Index spans **965 pages** with **~100,000 entries**, far exceeding schedule entries (~50,000).
- Includes implied and synonymous terms.
- Considered one of DDC's most enduring innovations.

195. Versions of DDC

Version	Description
Abridged Dewey	Single-volume edition (since 1884). Contains intro, schedules, four tables (1,2,3,6), and index. Simplified for schools/small libraries. Current: **15th edition, 2012**.
Electronic Dewey (Dewey for Windows)	CD-ROM edition (1996–2001). Replaced by online access.
WebDewey / WebDewey 2.0	Online version (since 2003). Constantly updated. Includes keyword search, number-building tools, and links to subject headings.

196. Revision Machinery and Procedure

- Managed by the **Dewey Section, Library of Congress (Washington D.C.)** since 1953.
- Drafts, tests, and approves all revisions.
- **Editor-in-Chief (since 2013): Michael Panzer.**
- Annual updates and full editions released every few years (latest full: **DDC–23, 2011**).
- Revisions rely on **user surveys, literary warrant,** and **LC Subject Headings**.
- Major revisions approved by the **Dewey Classification Editorial Policy Committee (DCEPC).**

197. Use and Popularity

- Used in **~200,000 libraries** worldwide.
- Dominant in the USA:
    - 95% of public/school libraries
    - 20% of special libraries
    - 25% of academic libraries
- Widely adopted in **India**; Hindi Abridged Dewey issued in **1976**.
- European DDC User Group (**EDUG**, est. 2007) coordinates European adaptation.
- Integrated in **MARC (field 082)** and **CIP** records for copy cataloguing.
- Supports digital catalogues (e.g., **BUBL LINK**, **WorldCat**, **NetFirst**) enabling hierarchical browsing online.

198. Problems in DDC

Issue	Description
Outdated Structure	Based on 19th-century map of knowledge; new subjects distort structure.
Rigid Decimal Division	Artificial base-10 restriction (Procrustean). Knowledge doesn't grow by tens.
Notational Weakness	Simple but inflexible for synthesis; unidimensional representation.
Faulty Distribution	Unequal subject space (e.g., cramped 621–629 Engineering).
Cultural Bias	Overemphasis on Western, Anglo-Saxon, Protestant perspectives (WASP bias).
Logical Flaws	Unnatural separations (e.g., 400 Language vs 800 Literature; 300 Social Sciences vs 900 History).
Theory-Practice Divide	Sciences (500) separated from their applications (600).

199. Future Trends

- **Internationalization:** Removing cultural bias; better global relevance.
- **Simplification:** More intuitive number building; transparent faceting.
- **Integration:** Closer alignment with **digital databases** and **information networks**.
- **OCLC Innovation:** New Dewey-based products (guides, posters, teaching kits).
- **Research Focus:** Using DDC for **Internet-based information mapping** (e.g., NetFirst browser).

200. Future and Status

- DDC has evolved continuously, absorbing modern classification theories and IT tools.
- Its **basic framework and decimal notation** remain stable yet adaptable.
- Now serves as both a **library shelf scheme** and a **digital subject access system**.
- Continues to lead globally due to:
    - Regular updates,
    - Broad acceptance,
    - Technological integration, and
    - Clear, flexible hierarchy.

201. Introduction to Colon Classification (CC)

Dr. **S.R. Ranganathan (1892–1972)**, often called the *Father of the Indian Library Movement*, transformed library science with unmatched depth and originality. His **Colon Classification (CC)** was the first fully *faceted classification system*, offering a scientific method to organize knowledge. While Melvil Dewey gave libraries a shelf order, Ranganathan gave them a **living, thinking system** — one that grows with knowledge itself. His influence still shapes modern classification, indexing, and information retrieval.

202. A Brief History of Colon Classification

Edition	Year	Highlights
1st	1933	First published by Madras Library Association; prototype of a faceted system
2nd	1939	Linked to *Prolegomena to Library Classification (1937)*; theory solidified
3rd	1950	Transition to analytico-synthetic structure; Delhi University phase

4th	1952	Introduction of the **five fundamental categories (PMEST)**
5th	1957	Proposed two versions (Basic and Depth); only Basic published
6th	1960/63	Mature, stable edition; globally recognized as standard
7th	1987	Posthumous revision by M.A. Gopinath; inconsistent but innovative

203. Genesis of the Colon Classification

- While studying in London, Ranganathan found **Dewey's enumerative approach** inadequate. DDC allowed multiple numbers for one subject, causing confusion and bias toward Western content.
- In 1924, during a visit to **Selfridge's department store**, he observed a **Meccano toy kit** demonstration — different models built from the same parts.
- This inspired his vision: a classification system where **basic concepts (facets)** could be combined like building blocks to form class numbers uniquely suited to each document.

Key Insight:

Knowledge is made of *fundamental ideas*, which can be synthesized into *specific subjects* by combining them with suitable connecting symbols — the "colon" being the first.

- Ranganathan applied this principle at **Madras University Library (1925)**, refining it through practice.
- The **Colon (:)** became both the name and symbol of his system.

204. Evolution and Theoretical Milestones

1. **Early Experiments (1924–1933)**
    - CC conceived and tested in Madras University Library.
    - First edition released in 1933.
    - Initially a **rigidly faceted** structure with limited flexibility.
2. **The Analytico-Synthetic Turn (1939–1960)**
    - *Prolegomena* (1937) introduced three planes of classification — *Idea, Verbal, and Notational*.
    - Shift from enumeration to **analysis and synthesis** — breaking down subjects into fundamental concepts and reassembling them.
3. **PMEST Theory (1952)**
    - Ranganathan proposed the **Five Fundamental Categories** as the minimum framework for all knowledge organization:
        - **P – Personality** (the focus or entity studied)
        - **M – Matter** (the property or substance)
        - **E – Energy** (the action or process)
        - **S – Space** (the location)
        - **T – Time** (the period)

- This universal structure became the backbone of the CC — a major theoretical breakthrough.

4. **International Recognition (1957–1963)**
    - 1957: *Dorking Conference* (England) declared faceted classification as the basis of future retrieval systems.
    - The **Classification Research Group (CRG)** in London embraced Ranganathan's analytical method, spreading his influence globally.
    - The **6th edition (1960/63)** became the most used and taught version worldwide.
5. **Later Developments (Post-1963)**
    - Refinement of category structure; expansion of common isolates.
    - CC described as **freely faceted** — capable of unlimited synthesis and self-extension.
    - However, despite Ranganathan's optimism, no classification can remain fully self-perpetuating without revision.

205. Versions of Colon Classification

Version	Period	Description
Version I (1933–1950)	*Rigidly Faceted Era*	Used only colon (:) as connector. Missing facets represented by dummy colons (e.g., 2:::N for "Libraries in 20th century"). Numbers were long and fragile.
Version II (1950–1963)	*Analytico-Synthetic Era*	PMEST introduced; each facet given a unique connecting symbol. Example: 2'N where apostrophe denotes Time. Simpler, shorter, and self-indicative.
Version III (1963–1987)	*Freely Faceted Era*	Matter split into subcategories; new isolates added. Developed **hospitable notation** — a flexible scheme for future growth. Aimed at self-perpetuation.

206. Core Features of Colon Classification

1. **General & Universal System**
    - Designed for all disciplines and document types — from books to electronic media.
2. **Analytico-Synthetic Method**
    - Breaks subjects into *facets* (analysis) and reassembles them (synthesis) to create precise, logical class numbers.
    - Example:
        - Medicine (Main class)
        - Eye (Personality)
        - Diseases (Energy)
        - India (Space)
        - 20th century (Time)

→ Combined as: **L,45;N'54** (illustrative only)

3. **Faceted Structure**
    - Each subject is expressed through its **facet sequence (PMEST)** — the universal grammar of knowledge.
    - Eliminates redundancy and supports infinite hospitality.
4. **Hospitality and Flexibility**
    - New subjects can be added without disturbing the structure.
    - Suits both manual catalogues and digital retrieval systems.
5. **Three Planes of Work (Classification Design)**

Plane	Description	Example
Idea Plane	Conceptual analysis — defining and grouping ideas	Distinguishing "Physics" from "Engineering"
Verbal Plane	Expressing ideas through words/terms	Assigning terms like "Mechanics," "Optics"
Notational Plane	Representing ideas through symbols/numbers	Translating into CC notation (e.g., C13:4)

6. **Faceted Notation**
    - Uses punctuation marks (colon, apostrophe, etc.) as **connecting symbols** between facets.
    - Each symbol has specific meaning:
        - : connects facets
        - ' indicates Time
        - ; joins related isolates
        - , separates sub-facets
7. **Dynamic & Theoretical Foundation**
    - Built on an evolving theory, not on enumeration.
    - Strong conceptual grounding in logic, mathematics, and linguistics.
8. **International Influence**
    - Inspired modern faceted systems such as **Bliss Bibliographic Classification (BC-2)**, **Universal Decimal Classification (UDC)** extensions, and even **metadata standards** used in digital systems.

207. Significance of Colon Classification

- **Pioneered faceted analysis**, now standard in library science and digital knowledge organization.
- Provided a **scientific framework** for constructing class numbers rather than memorizing lists.
- Established **PMEST** as a universal analytical model of subject structure.
- Inspired later systems (e.g., BC-2, CRG designs, PRECIS indexing).
- Set the foundation for **facet-based information retrieval** on the web and databases.

208. Essence of Ranganathan's Legacy

Ranganathan's genius lay not in creating a fixed system, but in envisioning a **living classification** — one that grows, adapts, and reflects the rhythm of knowledge itself. His Colon Classification turned cataloguing into a science, **bringing order to ideas, not just books**.

"Books are for use — and so is knowledge."
Ranganathan built a system that still honors that principle.

209. Three Planes of Work

Prior to Ranganathan, classification design was seen as intuitive — the work of gifted individuals.
Ranganathan turned it into a scientific process.
He divided classification design into **three planes**:

1. Idea Plane
2. Verbal Plane
3. Notational Plane

Each plane is guided by the **Five Laws of Library Science**, supported by **55 Canons, 22 Principles, and 13 Postulates**, plus ten Devices to improvise notation.

209.1 Idea Plane

It is the thinking, policy, and decision-making phase — the blueprint stage of classification design.
Here, subjects are analyzed, divided into **facets** and **isolates**, then arranged into **arrays** and **chains**.

- An **isolate** is the smallest unit of knowledge.
- A **facet** is a group of isolates obtained by applying a single characteristic.

The chosen characteristic should be:

- Concrete
- Relevant
- Objective
- Permanent

Characteristics should be applied one at a time and in order — from general to specific.

209.1.1 Arrays and Chains

a) **Array:**
A set of entities of equal rank arranged in a systematic order.
Canons guiding arrays:

- Canon of Exhaustiveness: include all possible entities.
- Canon of Exclusiveness: one entity should belong to only one array.
- Canon of Helpful Sequence: arrange in an order logical and helpful to users.

Examples of Helpful Sequence:

- Historical events → chronological order

- UN member states → alphabetical order
- Living species → evolutionary order
- Chemical elements → atomic number

b) **Chain:**
A sequence of entities arranged in decreasing extension (from general to specific).
Example: World → Asia → South Asia → India → North India → Delhi
Canons guiding chains:

- Canon of Decreasing Extension: broader to narrower.
- Canon of Modulation: no intermediate link should be omitted.

209.2 Verbal Plane

The verbal plane assigns **clear and standardized names** to the ideas formed in the idea plane.
It ensures that terms used in classification are precise and unambiguous.

Canons guiding the verbal plane:

- Avoid homonyms and synonyms.
- Maintain one-to-one correspondence between concept and term.
- Use context to define meaning clearly.
- Use neutral, non-opinionated language.
  Example: Avoid "major authors/minor authors"; use neutral terms instead.

209.3 Notational Plane

This is the execution phase where ideas and words are translated into **symbols** (notation).
The notation represents the structure and relationships of subjects.

Canons guiding the notational plane:

- Notation should be brief, simple, and easy to write.
- It should express the subject's structure.
- It should be hospitable to new subjects.
- It should be mnemonic and logically arranged.

Ranganathan's notation is mixed, using letters, numbers, and punctuation marks.
It is hierarchical, expressive, and highly hospitable — allowing expansion without disturbing the system.

Example of mnemonic use:

- Unity, God, World = 1
- Diseases and mechanical breakdowns share similar digits (to show parallelism)
- G;3, I;3, K;3, L;3 = physiology in general, plant, animal, and human respectively.

210. Notation in Colon Classification (CC–7)

The notation of CC–7 uses 74 symbols divided into six species:

1. Roman capitals (A–Z) → 26

2. Greek letter (Δ) → 1
3. Indo–Arabic numerals (0–9) → 10
4. Roman small letters (a–z, excluding i, l, o) → 23
5. Indicator digits with anteriorising value → 3
6. Ordinary indicators & punctuation (. : ; , - = + ( ) & etc.) → 11

Total = 74 symbols.

This broad base makes CC–7 the most **hospitable** notation system ever, though also one of the most complex.

211. Division of Knowledge in Colon Classification

Ranganathan viewed all knowledge as **one unified system**.
He recognized three main types of subjects:

1. Basic Subjects
2. Compound Subjects
3. Complex Subjects

211.1 Basic Subjects

Basic subjects are unitary subjects like Physics, Law, or Economics.

They are divided into two types:

a) **Main Basic Subjects**
b) **Non-Main Basic Subjects**

Each group is further divided into ten species based on their mode of formation:

Main Basic Subjects:

1. Traditional (Law, Physics)
2. Newly emerging (Library & Information Science)
3. Fused (Biotechnology)
4. Distilled (Research methodology)
5. Subject bundles (Ocean sciences)
6. Agglomerates (Social sciences)

Non-Main Basic Subjects:

1. Canonical classes (Algebra, Geometry)
2. System constituents (Marxian economy)
3. Environment constituents (Desert farming)
4. Special constituents (Gerontology, Medicine)

211.2 Complex Subjects

Complex subjects are interdisciplinary — combining two or more phases.
Example: Mathematics for Engineers, Comparative Physiology, Russian for Librarians.

There are **6 phase relations**, each of which can occur at **3 levels**, giving **18 total** relations.

Types of Phase Relations:

1. General relation
2. Bias relation
3. Comparison relation
4. Difference relation
5. Tool relation
6. Influencing relation

Levels of occurrence:

- Between two main classes (interdisciplinary)
- Between two facets of the same category (intra-facet)
- Between two isolates of the same array (intra-array)

Indicator symbol for phase relation: **&**
Each relation has its own indicator letter (a–g).

Example:

- Mathematics for Engineers → B0bD
- Influence of IT on Education → T0gQ

212. Main Classes and Their Order

Ranganathan's order of subjects was based on the **evolution of disciplines** and **their level of concreteness**.

He grouped knowledge into three broad sections:

1. Science and Technology
2. Humanities
3. Social Sciences

Arrangement principle:

- Sciences: increasing concreteness (theory → practice)
- Humanities: increasing richness of subject content
- Social sciences: increasing artificiality of laws

212.1 Order of Main Classes

Science and Technology:
A/B – Science / Mathematics
C/D – Physics / Engineering
E/F – Chemistry / Chemical Technology

G/H – Biology / Geology
I/J/K – Botany / Agriculture / Zoology
L – Medicine
M – Useful Arts

Humanities:
D – Spiritual Experience & Mysticism
N – Fine Arts
O/P – Literature / Language
Q/R/S – Religion / Philosophy / Psychology

Social Sciences:
T – Education
U/V – Geography / History
W/X – Political Science / Economics
Y/Z – Sociology / Law

212.2 Principles in Order of Main Classes

- Sciences (A–M): arranged by increasing concreteness.
  Example: B (Mathematics) → C (Physics) → D (Engineering).
- Humanities (N–S): arranged by increasing richness of content.
- Social sciences (T–Z): arranged by increasing artificiality.
  Example: Z (Law) is most artificial since it is human-made and changeable.

Ranganathan believed that **classification must depict the structure of knowledge** itself, not just provide shelf order.
Hence, the Colon Classification arranges disciplines to reflect both **logical dependency** and **historical evolution**.

213. Generalia Classes (A/Z, 1/9)

The **Generalia Class** in Colon Classification (CC) covers documents that are *not limited to any specific subject or discipline*. These may include general reference works, encyclopedias, dictionaries, or books dealing with knowledge as a whole.

- Ranganathan designated **A/Z** and **1/9** as generalia symbols.
- The scope of generalia is broad — it embraces works applicable across disciplines, such as general bibliographies, guides to research, or interdisciplinary compilations.
- These classes serve as the foundation or preliminary zone before the disciplinary main classes begin.

Ranganathan later introduced a new **main class Δ (Delta) — Spiritual Experience and Mysticism** — positioned between the **sciences** and the **humanities/social sciences**.
He viewed this class as the **meeting point of two cultures**, corresponding to C. P. Snow's concept of the "Two Cultures" — scientific and humanistic knowledge. Ranganathan, however, rejected Snow's view of separation and treated **spiritual experience** as the **fountainhead of all knowledge**, bridging the two.

Ranganathan's arrangement of main classes was based on **concrete and objective principles**, allowing new subjects to be placed logically without disturbing the system.
By the **7th edition (1987)**, the number of basic subjects had grown to nearly **800**, yet all found appropriate places in the extended array

214. Facet Analysis

Facet analysis, developed by Ranganathan, is the **core concept** and **methodological heart** of Colon Classification.
It transformed classification from a list-based (enumerative) model into a **faceted, analytical, and synthetic** process.
Every compound or complex subject must be **synthesized** from its constituent facets — no pre-built class numbers exist.

214.1 Eight Steps for Practical Classification

Ranganathan outlined **eight systematic steps** to convert a document's title into a precise class number:

1. **Determine the specific subject** of the document (by reading title, preface, table of contents, or text).
2. **Augment the raw title** with key words or phrases for clarity.
3. **Separate the main subject** from **common isolates** (bibliographies, reports, etc.).
4. **Identify the main class** where the subject belongs.
5. **Analyze the subject** into **PMEST** (Personality, Matter, Energy, Space, Time).
6. **Arrange the facets** according to the citation order (from Time → Personality).
7. **Construct the class number** by combining facets with proper connecting symbols.
8. **Add common isolates** (anteriorizing or posteriorizing) where applicable.

Example:
A document titled *"History of Agricultural Research in India in the 20th Century"* would undergo facet analysis into:

- P = Agriculture
- E = Research
- S = India
- T = 20th Century

214.2 Identification of Fundamental Categories (PMEST)

Ranganathan identified **five and only five fundamental categories** common to all subjects:

1. **Personality [P]** – the focal entity or subject studied.
2. **Matter [M]** – material, property, or method.
3. **Energy [E]** – action, process, or operation.
4. **Space [S]** – geographical or spatial context.
5. **Time [T]** – chronological or temporal context.

Indicators:

- Personality = comma (,)
- Matter = semicolon (;)
- Energy = colon (:)

- Space = dot (.)
- Time = apostrophe (’)

Matter category variants:

1. Matter–Property (M–P)
2. Matter–Method (M–M)
3. Matter–Material (M–Mt)

The **Residual Method** is used to identify Personality — after determining T, S, E, and M, the remaining concept is treated as Personality.

Examples of categories:

- **Time (T):** 20th century, Medieval period, Summer season
- **Space (S):** London, Europe, Hilly areas, NATO
- **Energy (E):** Teaching, Treatment, Management
- **Matter (M):** Marble sculpture, Wooden furniture
- **Personality (P):** Humans, Animals, Languages, Religions, Institutions

214.3 Rounds and Levels

Sometimes a category recurs in a subject — for example, multiple processes or levels of energy. Ranganathan explained this by the **Postulate of Rounds and Levels**:

- **Round:** recurrence of a category in a subject (e.g., multiple actions).
- **Level:** hierarchical position of a category within a round.

Rules:

- **P, M, and E** may occur in multiple rounds or levels.
- **S and T** appear only in the last round.
- **Energy** completes each round.

Example:
In *“Treatment of Human Diseases”*,

- First Energy = Disease
- Second Energy = Treatment

214.4 Facet Formula (Citation Order)

To ensure uniform synthesis, Ranganathan prescribed a **fixed order** for arranging facets — known as the **Facet Formula** or **Citation Order (PMEST)**.
It is governed by the **Principle of Dependency** (or Wall–Picture Principle):

Just as a picture depends on a wall, a process depends on its object.

Hence, **Personality** (object) precedes **Energy** (process).

Supporting principles:

- **Whole–Organ Principle** – whole precedes part.
- **Cow–Calf Principle** – primary entity precedes dependent one.
- **Actand–Action–Actor–Tool Principle** – derived combination for logical order.

General facet sequence:
Personality → Matter → Energy → Space → Time (PMEST)

This aligns with the **Classification Research Group (CRG)**'s order:
Things → Kinds → Parts → Materials → Properties → Processes → Operations → Agents

215. Synthesis

After analysis, facets are synthesized into a class number.
Common isolates are added — either **anteriorizing** (preceding subject) or **posteriorizing** (following subject).

Anteriorizing Common Isolates (ACIs):
Added before the subject using **double inverted commas (”)**.
Examples:
a = bibliography
k = encyclopedia
m = periodical
r = report
s = statistics
t = commission report
x = collected works

Posteriorizing Common Isolates (PCIs):
Added after the subject, moving it backward in sequence.
Three major types:

- Personality (,)
- Matter–Property (;)
- Energy (:)

Example:
2;5 ’P”a → Bibliography of 21st Century Classification
2”k73,N9 → Encyclopedia of Library & Information Science (USA)

Although expressive and precise, CC class numbers are often long and complex, which limits their popularity in daily library use.

216. Principle of Inversion

The **Principle of Inversion**, adopted from **UDC**, reverses the order of PMEST on the shelves.
While PMEST arranges from concrete (P) to abstract (T), shelving order requires the reverse — from abstract to concrete.
Thus, the **ordinal value** of indicator digits is fixed accordingly, ensuring a general-to-specific display on shelves.

217. APUPA Pattern

The **APUPA Pattern** (Alien–Penumbral–Umbral–Penumbral–Alien) defines how documents are arranged within a specific subject area.

- **A (Alien)** – unrelated materials at the boundaries.
- **P (Penumbral)** – documents indirectly related (e.g., bibliographies).
- **U (Umbral)** – core documents on the subject.
- **P (Penumbral)** – advanced or specialized materials.
- **A (Alien)** – unrelated materials beyond the subject.

This structure creates a logical and educational browsing sequence, forming a **pedagogically useful pattern**.

ACIs form the **first Penumbral region**;
PCIs form the **second Penumbral region**;
Between them lies the **Umbral region**, representing the pure subject.

Result:
Browsing a CC-arranged shelf mirrors the **natural progression of learning** from general to specialized knowledge.

218. Index

- The **6th edition** of CC had multiple subject indexes.
- The **7th edition** (1987) omitted them.
- In **2002**, a **machine-readable index (CINDEX)** was developed on CD (UNESCO WINISIS format), enhancing digital accessibility.

219. Colon Classification Revision, Use, and Status

- Despite being India's proposed national classification, **CC is not widely used today**.
- By the 1960s, about **24% of Indian libraries** reportedly used it; however, new libraries now mostly adopt **DDC**.
- CC numbers still appear in the **Indian National Bibliography** but lack institutional support for maintenance or revision.
- Currently, it is reprinted mainly for **academic teaching** purposes.
- The last edition (1987) failed to gain professional acceptance due to complexity and inconsistency.

220. Future of Colon Classification

- CC remains the **theoretical foundation of classification science**.
- Its **facet analysis**, **fundamental categories**, and **hospitality principles** underpin modern systems.
- The methodology is applied in:
    - Special and depth classifications
    - Thesauri and metadata design
    - Search engine query formulation

- Web directories and digital repositories

Although its physical use has declined, **Ranganathan's theories live on** in online retrieval, knowledge mapping, and AI-driven information systems.

"Facet analysis outlives its scheme — it's the mind of classification itself."
The body of Colon Classification may rest, but its **logic still builds the modern architecture of information retrieval.**

221. Universal Decimal Classification (UDC) – Introduction

The **Universal Decimal Classification (UDC)** is one of the most significant developments in modern bibliographic organization. It is also known as **European Dewey**, **Brussels Classification**, or **International Decimal Classification**. Originally derived from the **Dewey Decimal Classification (DDC)**, it was first referred to as the *Expanded Dewey*.

Unlike earlier systems created by individuals mainly for library shelf arrangement, the UDC was the **first truly international classification system**, designed by an **organization** for **bibliographic and documentation purposes**. It evolved as a tool not only for library shelving but also for **information retrieval** and **knowledge management** across all formats and media.

It remains one of the most **flexible and multidimensional systems**, capable of handling printed, electronic, and multimedia resources. In its digital form — **Electronic UDC** — it is now considered a promising retrieval structure for the future.

UDC is:

- **Multilingual** (available in over 50 languages)
- **Universal** (covers all fields of knowledge)
- **Highly structured** (strong in science and technology, yet applicable to all disciplines)

222. Brief History of UDC

The origin of UDC lies in the activities of the **International Institute of Bibliography (IIB)**, established in **Brussels in 1895** by **Paul Otlet (1869–1944)** and **Henri La Fontaine (1854–1943)**.

The IIB aimed to compile a **Universal Bibliography** called *Répertoire Bibliographique Universel* — a classified listing of technical and scientific literature from all over the world, in all languages and periods.

For this project, a **universal system of classification** was needed to arrange the millions of bibliographic records. Otlet and La Fontaine discovered **Dewey's Decimal Classification (DDC)** and obtained permission from **Melvil Dewey** to adapt and expand it.

They created an **expanded, detailed, and flexible version** of DDC with provisions for **synthesis**, allowing for the representation of micro-level subjects and complex relationships. This system came to be known as the **Universal Decimal Classification**.

It is credited as the **first faceted classification**, preceding Ranganathan's Colon Classification (1933), though Ranganathan independently developed his own method.

By **1921**, the IIB had collected over **12 million references** using UDC on catalog cards — an early example of a **global information retrieval system**.

223. Historical Development Phases (as per Rayward)

1. **French Period (1895–1933):**

- Foundation and grammar of the system developed.
- First edition appeared in **French (1905–1907)** under the title *Manuel du Répertoire Universel*.

2. **German Period (1933–1952):**
   - Further **details and expansions** were added.
   - Technical depth increased.
3. **English Period (1936–1975):**
   - Marked by **research, practical application, and modernization**.
   - First complete English version issued.
4. **International Period (1990 onwards):**
   - Transition to **digital and organizational modernization**.
   - UDC managed by a global body, the **UDC Consortium**.

224. Editions of UDC

Over time, UDC has been published in multiple **editions and levels of detail**, adapting to technological and linguistic developments.

1. **Early Editions:**
   - **1st Edition (1905–1907):** French, based on DDC 5th edition (1894), included 33,000 classes.
   - **2nd Edition (1923–1933):** French, titled *Classification Décimale Universelle*.
   - **3rd Edition:** German (started in 1933).
   - **4th Edition:** English (started in 1936).
2. **Versions till 1990:**
   - **Full Edition:** ~200,000 terms.
   - **Medium Edition:** ~70,000 terms.
   - **Abridged Edition:** ~22,000 terms.
   - **Pocket Edition (1999):** concise English version for quick reference.
3. **Modern Database Format:**
   - **Master Reference File (MRF):**
     - Contains over **70,000 subdivisions** in a standardized digital format.
     - Initially multilingual (French, German, English); now primarily English.
     - Functions as the **official authority database** for all UDC developments.
4. **UDC Summary:**
   - A simplified public version containing **~400–1000 classes**, available online at **www.udcc.org** for free educational access.

225. Current Editions (Post-2000)

1. **Standard Edition:**
    - Contains about **66,000 entries**.
    - Available both in **print** and as a **CDS/ISIS-based electronic database**.
    - Complies with **ISO 2709** format for data exchange.
    - Includes systematic tables and an alphabetical index.

Bibliographic Details:

- *Universal Decimal Classification, Complete Edition.*
  London: BSI, 2005.
    - Vol. 1: Systematic Tables (ISBN 0-580-45469-X)
    - Vol. 2: Alphabetical Index (ISBN 0-580-45470-3)

2. **UDC Online (MRF-based):**
    - Hosted by the **UDC Consortium**, The Hague, Netherlands.
    - Updated continuously, accessible via multi-user license.
    - Offers search by terms, class numbers, and number-building tools.
    - Allows copy–paste and export features for cataloging and indexing.
3. **Abridged Edition:**
    - Contains **4,100 classes**; useful for smaller libraries and teaching.
    - Published by the **British Standards Institution (BSI)**.

226. Main Features of UDC

1. **Truly International:**
    - Developed collaboratively and used worldwide in libraries, archives, databases, and documentation centers.
2. **Multilingual and Multiscript:**
    - Published officially in **French, English, and German**, and translated into **50+ languages**.
3. **Faceted and Synthetic Structure:**
    - Combines **enumeration and synthesis**, allowing precise representation of compound or micro subjects.
    - Users can construct class numbers using **auxiliaries** to express relationships, form, place, and time.
4. **Powerful Auxiliary Apparatus:**
    - Includes **common** and **special auxiliaries** for relations, aspects, and formats — enabling **multidimensional description**.
5. **Subject Analysis and Specification:**

- Focuses on the **content and scope** of documents rather than mere titles.

6. **Flexible Structure:**
    - Allows for constant **revision**, **expansion**, and **custom adaptation** to emerging disciplines.
7. **Universal Scope:**
    - All areas of human knowledge are represented — though science and technology receive more detailed treatment.
8. **Notation System:**
    - **Decimal notation** inherited from DDC but far more **expressive and relational**.
    - Enables synthesis through punctuation marks, e.g. :, /, +, and =.
9. **Applicability:**
    - Suitable for **bibliographies, digital repositories, databases, and websites**.
    - Excellent for **multimedia**, **networked**, and **online retrieval systems**.
10. **Governance and Maintenance:**

- Managed by the **UDC Consortium (UDCC)** — includes an **editor-in-chief**, **technical director**, and **international advisory board**.
- Coordinates ongoing **revisions**, **translations**, and **policy development**.

227. Summary of Significance

- UDC bridges the traditional library and modern information environments.
- It provides **disciplinary depth like DDC** but adds **synthetic power like CC**.
- The combination of **enumerative schedules + relational symbols + auxiliaries** makes it a **universal retrieval language**.
- In the digital era, UDC functions as both a **classification system** and a **metadata framework**, supporting **semantic search and data interoperability**.

228. Organization of Knowledge and Layout of the Schedules (Main Tables)

The **Universal Decimal Classification (UDC)** is a general classification system that covers the entire field of human knowledge. Its structure is derived from the **Dewey Decimal Classification (DDC)** but with notable modifications — especially the **merging of DDC's main class 4 (Philology)** with **Class 8 (Language and Literature)**, leaving **Class 4 vacant**.

Unlike DDC, UDC has **no requirement for a minimum of three digits** in class numbers.

Main Classes (0–9):
0 — Generalities
1 — Philosophy. Psychology
2 — Religion. Theology
3 — Social Sciences
4 — [Vacant]
5 — Natural Sciences. Mathematics
6 — Technology. Applied Sciences

7 — The Arts
8 — Language. Linguistics. Literature
9 — Geography. Biography. History

Each main class is divided into **ten divisions**, and each division is further divided into **sections** (decimal expansion).

Example:
Class 5 – Natural Sciences
51 — Mathematics
52 — Astronomy
53 — Physics
54 — Chemistry
55 — Earth Sciences
56 — Palaeontology
57 — Biology
58 — Botany
59 — Zoology

Each section can then be subdivided decimally:
536 — Heat and Thermodynamics
536.2 — Heat Conduction
536.5 — Temperature
536.6 — Calorimetry
536.7 — Entropy

Dots are inserted after every third digit for clarity, e.g.,
621.882.215 — Round-headed screws
621.882.215.3 — Round-headed screws with cross recesses

The **schedules 0–9 and their subdivisions** are collectively known as the **Main Tables**.

229. Auxiliary Tables

Any number from the Main Table can be extended using **Auxiliaries** — symbols or notations added to give further specification or context to a class number.

Two main types of auxiliaries:

1. **Common Auxiliaries** — applicable universally to all classes.
2. **Special Auxiliaries** — applicable only to specified classes.

230. Common Auxiliaries

Over **10,000 Common Auxiliaries** exist, divided into tables (1a–1k). They specify:

- Form (books, periodicals, reports, etc.)
- Place (countries, regions)
- Time (historical periods, dates)
- Language
- Ethnic groups and other aspects

Examples of Common Auxiliaries in Action:

1. *Foreign relations between Pakistan and India (Urdu text)*
   327 (540:549) =214.22
2. *Hindi-Urdu journal of Indian foreign policy*
   327 (540) (05) =214.21 =214.22
3. *Birds of India and Nepal: A textbook in Bengali*
   598.2 (540+541.35) (075) =214.32
4. *Weather on 1 January 2014 in India (report)*
   551.5 "2014.01.01" (540) (047)
5. *Critical study of Shakespeare's tragic plays*
   821.111 Shak-21.09

Common auxiliaries can be combined as needed for richer detail.

231. Special Auxiliaries

These auxiliaries apply to a **limited range of numbers** and are indicated by **sidelines** or specific punctuation marks.

Three main notational signs:

1. .0 (Point naught)
2. ' (Apostrophe)
3. - (Hyphen)

Examples:

1. .02 — General laws (applies to Physics and all subdivisions)
   531.02 — General laws of mechanics
   531.55.02 — General laws of external ballistics
2. .081 — Units and constants
   531.55.081 — Units in external ballistics
   534.6.081 — Units of acoustic measurement
3. -31 — Oxides
   546.26-31 — Carbon oxides
   546.47-31 — Zinc oxides
4. '282 — Dialects
   811.111'282 — Dialects of the English language
   811.134'282(8) — Dialects of Spanish in South America

232. Citation Order

When multiple auxiliaries are combined, UDC follows the **Principle of Inversion** — meaning the order in which they appear in the class number is **the reverse of their conceptual arrangement on shelves**.

General order:
Class Number → Special Auxiliaries → Common Auxiliaries

Common Auxiliaries are added from most specific to least specific (e.g., language before place before time).

Example:
Unemployed medical librarianship graduates in India in 2000 CE — a Hindi motion picture
026:61-577.19 (540) "2000" (084.122) =214.21

UDC's flexibility allows local rearrangements for practical shelving or retrieval. For instance, journals may be grouped in one section:
(05)5 — Journal of Science
(05)53 — Journal of Physics
(05)54 — Journal of Chemistry

Or an Indology section may be created:
(540)32 — Indian Politics
(540)33 — Indian Economics
(540)336.71 — Indian Banking
(540)34 — Indian Laws
(540)39 — Indian Folklore

233. Notation and Layout

The **UDC notation** uses a mix of **decimal numbers, mathematical signs, and punctuation**, sometimes supported by **alphabets**.
It is **hierarchical, expressive, faceted, synthetic, and language-neutral**.

Symbols Used in Tables (for interpretation only):

Symbol	Name	Meaning
→	Arrow	See also (cross reference)
à	Diamond	Example of a built number
[ ]	Square	Inclusion note
		Sideline (special auxiliary)
*	Asterisk	Non-UDC numbers
A/Z	Alphabets	Alphabetical subdivisions

Example:
56 à 56:581 — General Paleontology
030 — General reference works (e.g., Encyclopedias)

Symbols are for **interpretation** only and never form part of the actual class number.

234. Index

The **UDC Index** provides access to all terms used in the schedules, including auxiliaries and compound numbers.

- Uses **British spellings** and follows **ISO 999** standards.
- Arranged **word-by-word**.
- Includes all divisions, inclusion notes, and auxiliary numbers.
- Each index term has an average of **three access points**.

Example of disambiguation:

- Axes (tools) — 672.7
- Axes (plants) — 581.4
- Line (art) — 7.013

Example of synonyms:
Both *Aves* and *Birds* are indexed separately to avoid "see" references.

The index is comprehensive, user-friendly, and aids in quick navigation through the schedules.

235. Management, Maintenance, and Revision

After the decline of the **FID (International Federation for Information and Documentation)**, UDC's management was taken over by the **UDC Consortium (UDCC)**, established in **1992** as a **non-profit self-financed organization**.

Headquarters: National Library of the Netherlands, The Hague.
Director: Alan Hopkinson (as per text).
Editor-in-Chief: Dr. Aida Slavic (since 2010).

The **UDCC**:

- Owns, updates, and markets UDC.
- Employs a full-time editor and a 12-member editorial team.
- Oversees translation, maintenance, and MRF database updates.
- Operates discussion forums and publishes annual updates.

Revisions:

- Conducted democratically with global participation.
- Users, subject experts, and consortium members review proposed changes before inclusion.
- Annual updates published as **UDC: Extensions and Corrections** (since 1993).

236. Problems and Limitations

Despite its success, UDC faces some recurring challenges:

1. Dependency on DDC's basic structure.
2. Overlapping symbols (– and 0) can confuse retrieval.
3. Continuous evolution of auxiliaries complicates consistency.
4. Lack of a fixed citation order standard.
5. Class 4 remains vacant.
6. Frequent notational updates disrupt stability.
7. Limited institutional financial backing.

237. Use and Applications

UDC is one of the **three major classification systems** globally (alongside DDC and LCC).

Applications:

- Library shelf classification and bibliographies
- Databases and online catalogs (OPACs)
- Information systems, websites, and subject gateways
- Non-library uses — organizing **maps, coins, stamps, photographs, artworks, CDs, and archives**

Digital strengths:

- Excellent for computer-based retrieval (hierarchical and faceted structure)
- Compatible with Boolean, string, and hierarchical browsing searches
- Used in major online repositories (e.g., NISS in the UK)

Additional uses:

- Building **thesauri, taxonomies, and multilingual indexing vocabularies**
- Acting as a **switching language** for cross-system interoperability

UDC's multilingual database makes it a key tool for **knowledge organization in global networks**.

238. Future Prospects

Although occasionally criticized for its slow development and DDC roots, UDC remains an enduring, evolving system.

Current Trends:

- Integration with **visual and semantic technologies** (e.g., Magnaview software visualization).
- **Faceted restructuring** of key classes (e.g., Class 61 Medicine).
- Continuous modernization under the **UDCC** with digital architecture.

Despite financial challenges, UDC has sustained itself for over a century through adaptability and innovation.

Future role:

- As a **semantic classification backbone** for digital libraries and web-based retrieval.
- As a **universal metadata framework** supporting multilingual access and information exchange.

"UDC has not only survived but matured — from a bibliographic tool into a global framework for organizing knowledge across languages, media, and technologies."

239. Rise of Library Science in Late 19th Century USA

In the early 19th century, librarianship was not yet a profession. Libraries were managed by **gentleman scholars** — people who loved books, often without formal training or concern for user service. A librarian was called a *curator*, a caretaker of books rather than a guide to knowledge.

As **education expanded** and **democracy deepened**, the United States experienced a growing demand for libraries to serve its increasingly literate public. The Industrial Revolution and urban growth created new learning needs — libraries were seen as tools of civic education, lifelong learning, and public enlightenment.

With growing book collections and reading communities, libraries needed better **organization**, **cataloguing systems**, and **trained professionals**. This new environment, practical and democratic, gave birth to **modern librarianship**.

240. Charles Ammi Cutter (1837–1903): The Prince of Library Science

Among the pioneers who shaped library science in the U.S., **Charles Ammi Cutter** stands out as a visionary. While **Melvil Dewey** is called the *Father of Modern Librarianship*, Cutter is rightly regarded as the *Prince of the Profession*.

He was a **self-taught genius**, whose ideas in cataloguing, classification, and library organization laid the foundation of modern library practice.

241. Early Life and Education

- Born **March 14, 1837**, in **Boston, Massachusetts**, into a cultured merchant family.
- Raised by his grandfather and two devout aunts who provided him a disciplined education rooted in **Christian and classical studies**.
- Initially prepared for the **Unitarian ministry**, he entered **Harvard Divinity School** in 1856, graduating in 1859.
- While studying, he worked as **student librarian** (1857–1859), rearranging collections and creating catalogues — his first accidental step into librarianship.

Under **Dr. Ezra Abott**, Cutter became an **assistant cataloguer** at **Harvard College Library (1860–1868)**, where he helped create one of the earliest **public card catalogues**.

In **1869**, he became **librarian of the Boston Athenæum**, succeeding **William Frederick Poole** (famous for *Poole's Index to Periodical Literature*). The Athenaeum's vast scholarly collection became his laboratory for innovation.

Between **1874–1882**, Cutter compiled a **five-volume dictionary catalogue** (100,000 entries; 3,042 pages), creating the foundation of **modern cataloguing principles**.

To standardize cataloguing practice, he wrote **Rules for a Dictionary Catalogue (1876)**, revised in **1889** and **1891**, with the **fourth posthumous edition (1904)** edited by his nephew **William Parker Cutter**.

His work introduced systematic principles for **subject and author cataloguing**, influencing later systems like:

- **Library of Congress Subject Headings (LCSH)**
- **Sears List of Subject Headings**

Cutter's clarity and precision in cataloguing rules earned him lasting respect; he is often called **the Father of Modern Cataloguing**.

242. Major Contributions

Cutter's three chief contributions define his legacy:

1. **Rules for a Dictionary Catalogue (1876)**
    - Established standardized rules for cataloguing.
    - Defined author, title, and subject entry methods.

- Emphasized *user approach* and *vocabulary control*.

2. **Expansive Classification (EC) (1891–1903)**
    - Cutter's alternative to Dewey's Decimal Classification.
    - Used **alphabetic notation** for main classes and **numerals** for subdivisions.
    - Consisted of **seven progressive schedules** — from small village libraries to large national libraries.
    - Arrangement of classes followed a **scientific and evolutionary order**.
    - Influenced later systems like:
        - **Library of Congress Classification (LCC)**
        - **Bliss Bibliographic Classification (BC)**
3. **Cutter Author Tables**
    - Developed as an extension of his Expansive Classification.
    - Provided an alphanumeric system (letters and digits) to represent **authors or headings**.
    - Used for **sub-arranging books** under the same class number.
    - The system is still in use — modern versions like **Cutter-Sanborn Tables** derive from it.

243. Cutter's Place in the Library Pantheon

Cutter was not just a cataloguer or classifier — he was a **builder of institutions and ideas**.

- **Co-founder of the American Library Association (ALA)** (1876)
- **President of ALA** (1887–1889)
- **Co-founder and Editor** of the *Library Journal* (1881–1893)
- Advocated **public library service**, **library education**, and **user-centered access**
- Served as **librarian of Forbes Library, Northampton (1894–1903)**, where he pioneered:
    - Lending of books and *realia*
    - Community outreach and extension services

Cutter combined **scholarship with service**, **precision with practicality**. Cheerful and modest, he was a man of wide culture, fond of cycling, boating, theater, and music — a New England intellectual in the tradition of **Thoreau and Emerson**.

He died on **September 6, 1903**, leaving behind his wife **Sarah** and sons **Louis and Roland**.

244. Book Numbers: Definition and Need

The **Book Number** refines shelf arrangement beyond the class number.
While the **class number** groups documents by *subject*, the **book number** distinguishes *individual documents* within the same subject.

Definition:
A *book number* is a unique symbol or code assigned to each document having the same class number to ensure precise and orderly arrangement on the shelf.

Need:

- To individualize books on the same subject.
- To avoid confusion among multiple works under identical class numbers.
- To achieve fine, logical shelf order.
- To serve as a *complete address* in combination with the class number.

Example:
If a library has five biographies of Mahatma Gandhi (same class number), each is given a distinct **book number** based on author or year, such as:

- 923.2 G19 (Fischer)
- 923.2 G19a (Louis Fischer)
- 923.2 G19b (Tendulkar)

Thus, a **call number = Class number + Book number**.

245. Origin of Book Numbers

In **pre-Dewey fixed-location systems**, each book's position was fixed physically; thus, no book numbers were needed.

When **Dewey introduced relative classification (1876)**, multiple books could share the same class number, requiring another element to maintain order.

Melvil Dewey's Solution:

- Suggested adding **serial numbers (1, 2, 3, …)** to books in accession order.
- This gave each book a unique shelf position.

Cutter's Criticism:

- Accession order lacked *logic* or *mnemonic value*.
- He proposed a **systematic, meaningful book number** based on the **author's name** instead.

246. Cutter's Original Book Number System

Cutter designed a **decimal author number table**, assigning digits to letters for mnemonic arrangement.

Letters	Number	Letters	Number
A–Bo	0	M	5
Br–C	1	N–R	6
D–F	2	S	7
G–H	3	T–V	8
I–L	4	W–Z	9

Example:

- An author with the name *Sharma* → **7**
- *Foster* → **2**
- *Miller* → **5**

Advantages:

1. Clearly distinguishes book numbers from class numbers.
2. Removes dependence on book size or physical dimension.
3. Introduces a **decimal, expandable notation** allowing easy insertion of new authors.

247. Development by John Edmands and Later Refinement

The idea of book numbers gained widespread attention.

In **1879**, the *Library Journal* published a symposium on book numbers with contributions from:

- **Melvil Dewey**
- **C. A. Cutter**
- **Josephus Nelson Larned**
- **John Edmands**
- **John Fitzpatrick**

John Edmands (1820–1915) made a breakthrough suggestion:

- The author's **initial letter** should be followed by **decimal digits representing the rest of the name**.
- This created an alphanumeric code that *suggested the author's name itself*.

Cutter's Response:
Initially skeptical, Cutter feared confusion between class and book numbers.
However, he later embraced the concept, refining Edmands' idea into his own **Cutter Tables** — now standard in library classification worldwide.

At the **ALA Conference (1885)**, **Dewey endorsed Cutter's alphanumeric approach**, calling it:

"The best plan I can conceive for alphabetical arrangement."

Thus, Cutter's system became the **universal method** for assigning **book numbers**, used in nearly all modern libraries today.

248. Legacy

Cutter's innovations — **dictionary catalogues**, **Expansive Classification**, and **author tables** — transformed librarianship into a **science of information organization**.

His ideas on:

- **User-centered cataloguing**
- **Systematic classification**
- **Mnemonic notation**

249. Knowledge Organization as a Discipline

Knowledge Organization (KO) has evolved from a practical activity of classification into a full-fledged academic and professional discipline over the past century.

Main Features:

1. **Different Schools of Thought:**
   KO has developed distinct schools based on methodology, philosophy, and nationality—such as the **Indian**, **British**, **American**, and **French** schools.

2. **Theory and Practice Connection:**
   KO integrates theoretical principles with practical applications, ensuring that systems of classification are both logical and functional.

3. **Extensive Literature:**
   Its vast body of research is compiled in resources like **ICIB (International Classification and Indexing Bibliography)** by **Ingetraut Dahlberg**, covering 1952–1987. The *Knowledge Organization* journal continues to publish ongoing bibliographies.

4. **Academic Recognition:**
   KO is taught globally at the university level as an integral part of Library and Information Science programs.

5. **Dedicated Journals:**
   Prominent journals include *Knowledge Organization*, *Cataloguing and Classification Quarterly*, and *Journal of Internet Cataloguing*.

6. **Professional Bodies:**
   National and international organizations actively promote KO research and development, offering platforms for collaboration and knowledge exchange.

7. **Conferences and Seminars:**
   Regular professional gatherings encourage discussion, innovation, and dissemination of new developments in the field.

250. Objectives of a Professional Association

A professional association fosters interaction, knowledge sharing, and ethical practice among its members.

Key Objectives:

1. Encourage active **participation and exchange** among professionals.
2. Support **personal and professional development** through learning and leadership opportunities.
3. Establish **standards of quality** and **ethical codes** for professional conduct.
4. Serve as a **liaison with the government** and act as an interface between professionals and the public.
5. Promote **research, training, and cooperation** in specialized fields like Knowledge Organization.

251. Classification Research Group (CRG)

Founded in **1952 in London** after the 1948 Royal Society Scientific Information Conference, CRG played a crucial role in modern classification theory.

Key Members:
Derek Austin, Eric Coates, Jason Farradane, Robert Fairthorne, Douglas Foskett, Barbara Kyle, Jack Mills, Bernard Palmer, and B.C. Vickery.

Main Contributions:

1. **Facet Analysis and Integrative Levels:**
   Developed principles of **faceted classification** beyond Ranganathan's five categories, emphasizing both analysis and synthesis in scheme construction.

2. **Manifesto (1955):**
   Published *"The need for a faceted classification as the basis of all methods of information retrieval"* in *Library Association Record*.

3. **Special Subject Schemes:**
   Designed faceted classifications for **soil science**, **garment technology**, **diamond technology**, **pharmaceuticals**, and **occupational safety**.

4. **PRECIS Development:**
   The NATO-funded project led to **PRECIS (Preserved Context Index System)** by Derek Austin for the British National Bibliography.

5. **Bibliographic Classification Revision:**
   Later work focused on revising **H.E. Bliss's Bibliographic Classification** under **Jack Mills**.

6. **Impact:**
   CRG's research significantly shaped 20th-century library classification theory, promoting structured, logical information retrieval systems.

252. International Society for Knowledge Organization (ISKO)

Foundation and Mission:
Established in **1989 (Germany)**, ISKO is the leading global body for professionals and researchers in knowledge organization, classification, and information structure.
Its mission is to **advance conceptual and practical work in KO** for all kinds of systems—databases, libraries, dictionaries, and the Internet.

Membership:
Over **400 professionals** from disciplines such as library science, linguistics, computer science, and philosophy.

Main Functions:

1. Promote **research and development** of knowledge organization systems (KOS).
2. Enable **communication and networking** among KO professionals.
3. Serve as a **link between international and national organizations** addressing KO issues.

Key Collaborations:
ISKO cooperates with **UNESCO**, **ISO**, **IFLA**, **ASIS&T**, **NKOS**, and **Infoterm**.

253. Mission and Activities of ISKO

Mission:
To promote interdisciplinary research and global collaboration in knowledge organization for libraries, databases, and digital systems.

Activities:

1. **International Conferences:**
   Biennial global meetings and national events on specialized KO topics.

2. **Publications:**
    - *Knowledge Organization (KO)* – quarterly journal.
    - *ISKO News* – section within KO.
    - *Advances in Knowledge Organization (AKO)* – book series.
3. **Networking:**
   Encourages member collaboration through chapters and conferences.

254. Organization and Structure of ISKO

1. **Executive Board:**
   7 elected members manage global operations.
2. **Scientific Advisory Council:**
   22 members guide academic and policy matters.
3. **General Body Meetings:**
   Held biennially alongside international conferences.
4. **National Chapters:**
   Active in **India, UK, USA, France, Germany, Brazil, China, Italy, Poland, Spain, and Canada**.
5. **Partnerships:**
   Collaborates with **IFLA**, **ASIS&T SIG/CR**, **NKOS**, and **Infoterm**.

Significance:
ISKO remains the **most active and influential global association** in KO, honoring the vision of **Dr. Ingetraut Dahlberg**, deeply inspired by **Dr. S.R. Ranganathan**.

Unit.4. Subject Classification

255. Introduction – General Theory of Library Classification

The *theory of library classification* forms the foundation for understanding how knowledge can be organized systematically. A theory is essentially a **structured set of principles** that explains existing phenomena and provides a framework for further research and improvement. Like other scientific disciplines, the theory of classification has developed gradually, changing with new knowledge and needs.

There are **two distinct stages** in the evolution of classification theory:

1. **Stage 1 – Descriptive Theory**
    - Emerged from practical experience in designing and using classification schemes.
    - Scholars such as **J.D. Brown, E.C. Richardson, Edward Hulme, W.C.B. Sayers, H.E. Bliss,** and **S.R. Ranganathan** contributed significantly.
    - Focused on describing and interpreting existing practices.
    - Provided the foundation for later theoretical developments.
2. **Stage 2 – Dynamic Theory**
    - Developed mainly by **S.R. Ranganathan**, who transformed classification from a craft into a **scientific discipline**.
    - Introduced **laws, canons, postulates, and principles** to guide classification design.
    - Emphasized adaptability to the continuous **growth and evolution of knowledge**.
    - Made classification an **objective, methodological process** rather than an intuitive one.

256. Theory of Library Classification

Before understanding the theory itself, it's essential to grasp **why a theory is needed** and **how it contributes** to the discipline.

256.1 Importance of a Theory

A theory provides structure and legitimacy to any field of study.

Key Points:

1. A **theory organizes principles** that explain the *what* and *why* of existing phenomena.
2. It gives a **scientific foundation** to a subject, helping it mature into a recognized discipline.
3. It allows for **systematic investigation and refinement** of methods.
4. In classification, theory ensures **consistency, coherence, and progress** in how knowledge is arranged.

Without theory, classification would remain a collection of isolated techniques rather than an organized system.

256.2 Need for a Theory

Early classification schemes were designed for **practical convenience**, not for longevity or adaptability.

Reasons for Needing a Theory:

1. **Growth of Knowledge:** The number and complexity of subjects have expanded over time, making older schemes inadequate.
2. **Changing Information Needs:** Classification must adapt to evolving disciplines and interdisciplinary research.
3. **Scientific Consistency:** A guiding theory ensures logical structure and stability amid change.
4. **Future Readiness:** A dynamic theory prepares classification systems for the **continuous evolution of knowledge**.

Thus, theory provides the **intellectual framework** for designing systems that can endure the test of time.

256.3 Development of a Theory

The history of classification shows a natural progression: **practice precedes theory**. Practical efforts in organizing knowledge led to reflection, analysis, and eventually, theoretical formulation.

Two Phases of Development:

1. **Descriptive Phase (Static Theory):**
    - Developed after early schemes like **Dewey Decimal Classification (DDC)**.
    - Scholars such as **Richardson** and **Sayers** compared existing schemes to identify underlying principles.
    - The focus was on **describing existing practices**, not on evolving new methods.
    - Parkhi (in *Library Classification: Evolution of a Dynamic Theory*) called this stage **"descriptive formulation and interpretative explanation."**
2. **Dynamic Phase:**
    - Began with **Ranganathan's work after 1949**.
    - First fully expressed in his **Prolegomena to Library Classification (1957)**.
    - Refined further through research at **Documentation Research and Training Centre (DRTC), Bangalore (est. 1962)**.
    - Aimed to create a **living, adaptable framework** for both book and article classification.
    - Introduced tools like **facet analysis**, **fundamental categories**, and **postulate-based methodology**.

Result:
Ranganathan's dynamic theory turned classification into a **scientific, evolving system**, capable of handling the rapid growth and diversification of knowledge.

257. Significance of Dynamic Theory

Ranganathan's contribution marked a turning point: classification became not just a record of human knowledge but a **dynamic system for managing intellectual progress**.

Key Features:

1. **Guided by Laws and Canons** – ensuring logical and consistent arrangement.
2. **Adaptable to Change** – capable of accommodating new subjects and relations.

3. **Applicable to All Forms of Information** – books, articles, databases, and beyond.
4. **Foundation for Research and Innovation** – influencing modern knowledge organization systems and metadata structures.

258. Descriptive Theory of Library Classification

In the early phase of library organization, classification evolved from **practice to theory**. The **descriptive theory** was the **first stage** in the development of classification thought—arising directly from practical experience and empirical observation.

It relied on the **methods and intuitions of early classifiers**, not on systematic scientific analysis. The descriptive theory reflected the totality of knowledge as it existed at the time and was shaped largely by trial, observation, and refinement of practice.

This phase (roughly **1898–1937**) was shaped by the contributions of pioneers such as **J.D. Brown, E.C. Richardson, E.W. Hulme, W.C.B. Sayers, H.E. Bliss,** and **S.R. Ranganathan**.

258.1 Key Features of Descriptive Theory

1. **Empirical Foundation:**
   Based on practices drawn from existing classification schemes rather than abstract reasoning.
2. **Static Nature:**
   Aimed to describe and organize knowledge as it existed—without anticipating its growth or change.
3. **Descriptive, Not Prescriptive:**
   Focused on *how* schemes worked, not *how they should be designed*.
4. **Foundation for Later Development:**
   Provided the groundwork upon which **Ranganathan's dynamic theory** later evolved.

258.2 Major Contributors to Descriptive Theory

(a) J.D. Brown (1862–1914)

An English librarian known for his experimental spirit, **Brown** produced three classification schemes:

1. **Guinn-Brown Scheme (1894)** – created with J.H. Quinn; limited impact.
2. **Adjustable Classification (1897)** – flexible but inadequate.
3. **Subject Classification (1906, rev. 1914 & 1939)** – his major work.

Main Principles:

1. **Source Principle:** Every science or art originates from fundamental factors — *matter* and *force*, leading to *life*, *mind*, and *records*.
2. **One Place Theory:** Each subject should occupy **only one position** in the scheme, regardless of its different aspects.
   - Example: *Rose* should be classified under **botany**, not under decoration or geography.
   - His approach was **topical**, not disciplinary, unlike DDC or LC.
3. **Science and Its Applications Theory:** A subject should be placed close to the **science from which it arises**.
   - Example: *Coal* → *Mineralogy*, *Libraries* → *Library Economy*.

- Eliminated artificial distinctions like “Pure” vs “Applied” sciences.

Though innovative, his topical method was too rigid and did not succeed in practice.

(b) E.C. Richardson (1860–1939)

Librarian of Hartford Theological Seminary and later Princeton University, **E.C. Richardson** was the **first to propose a systematic theory** of classification.

His book *Classification: Theoretical and Practical (1910)* was the **first textbook** on the subject and heavily influenced Sayers.

Criteria of Classification (Principles):

1. Classes should follow the **natural and historical order** of things.
2. **Minute division** of classes is essential.
3. Arrange things by **likeness and unlikeness**.
4. Classification should be designed for **use** — since libraries exist to serve users.
5. Schemes should include **notation** — preferably **mixed symbols** with **decimal** and **mnemonic** features.

He believed that “**things in nature are already classified; humans must only discover and record that order.**”

(c) E.W. Hulme (1859–1954)

Librarian of the Patent Office Library, London, **Hulme** published *Principles of Book Classification* (1911–1912). His ideas influenced many later thinkers, including Sayers and Ranganathan.

Main Contributions:

1. Distinguished between **Mechanical** and **Philosophical** classifications.
    - *Book classification* belongs to the **mechanical** type.
2. Proposed that classification should be **based on the existing literature** — a concept called **Literary Warrant**.
    - Subjects are justified only if there is **literature already published** on them.
    - Example: If books exist on *Electricity and Magnetism*, the scheme should have a class for that topic.
3. Emphasized **systematic coordination** of classes, not just isolated arrangement.

Influence:

- The principle of *literary warrant* guided the **Library of Congress Classification (LCC)** and later influenced **Ranganathan**, who redefined it to mean that subjects should be arranged in order of **decreasing quantity of literature** available.

(d) W.C.B. Sayers (1881–1960)

A major British theoretician and teacher of **S.R. Ranganathan**, Sayers never designed a scheme himself but laid down the **grammar and logic** of classification.

Major Works:

1. *Canons of Classification* (1915)
2. *Grammar of Classification* (1915, 1935)
3. *Introduction to Library Classification* (1918–1958)
4. *Manual of Library Classification* (1926–1975, revised by Arthur Maltby and later by Rita Marcella & Robert Newton, 1994).

He is often called the **first grammarian of classification**.

Sayers' 29 Canons of Classification

Grouped into **six categories**:

1. **Canons of Definition (6)** – Define what classification is and identify characteristics of likeness.
    - Example: Classification groups things based on shared characteristics.
2. **Canons of Division (7)** – Guide how classes are divided.
    - Division must proceed **from general to specific**, using **consistent characteristics**.
    - Natural (inherent) characteristics preferred over artificial ones.
3. **Canons of Terms (4)** – Stress **clarity and consistency** in naming classes.
    - Each term should be **unique, unambiguous**, and consistently used.
4. **Canons of Book Classification (4)** – Explain how to arrange books logically.
    - Schemes should include **generalia class, form classes, theory/history sections, notation, and index**.
5. **Canons of Notation (4)** – Define requirements for notational systems.
    - Notation should be **brief, simple, flexible, and mnemonic**.
6. **Canons of Book Classification Schemes (5)** – Deal with **revision and maintenance** of schemes.
    - Schemes should include clear **instructions, order of subjects, and provision for revision**.

258.3 Significance of Descriptive Theory

1. Provided the **first formal understanding** of how knowledge could be organized.
2. Transitioned classification from **intuition to intellectual discipline**.
3. Set the **foundation** for Ranganathan's **Dynamic Theory**.
4. Introduced enduring principles — *one place theory, literary warrant, canons, notation systems* — that continue to guide library science today.

259. H. E. Bliss (1870 – 1955)

Henry Evelyn Bliss was one of the most rigorous and philosophically minded thinkers in the field of library classification. His life's work was devoted to shaping classification into a **systematic science**, grounded in logic, consensus, and the natural order of knowledge.

His two foundational books —

1. *Organization of Knowledge and the System of Science* (1929)

2. *Organization of Knowledge in Libraries and the Subject Approach to Books* (1933; 2nd ed. 1939) — laid down the theoretical base that later guided the construction of his **Bibliographic Classification (BC)**, first outlined in 1935.

259.1 Major Concepts Introduced by Bliss

1. Consensus
Bliss believed that the structure of knowledge could be determined through a **scientific and educational consensus** — a general agreement among scholars about the nature, scope, and order of disciplines.

- A classification reflecting this consensus would be more **stable, flexible, and durable**.
- He held that the natural order of knowledge closely matches this consensual order.
- Example: His main classes follow the logical and widely accepted progression from natural sciences to social sciences to humanities.

2. Subordination
Bliss proposed two complementary kinds of subordination:

- **(a) Subordination of the special to the general** — broader subjects should precede narrower ones, following the **principle of decreasing extension**.
    - Example: *Botany → Roses → Hybrid Roses.*
- **(b) Gradation by Speciality (Dependency Principle)** — disciplines that depend on the findings of others should follow them in sequence.
    - Example: *Physics → Chemistry → Biology → Psychology.*

This created a **logical hierarchy** where general sciences support the more specialized ones.

3. Collocation
Collocation means **placing closely related subjects together** so that users can move smoothly across related areas.

- Example: Bliss placed *Language* next to *Literature*, *Education* beside *Psychology*, and *Chemical Technology* near *Chemistry.*
- Ranganathan later referred to this idea as the **filiatory sequence**, meaning subjects should flow naturally from one to the next.

4. Alternative Locations
Bliss rejected rigid, one-way classification.

- Recognized that **different libraries or special collections** might prefer different orders.
- Therefore, his scheme allowed **alternative placements** for certain subjects.
    - Example: *Theology* could be kept with *Philosophy* or under *Religion.*
    - *Aeronautics* could be under *Applied Physics* or *Useful Arts.*
- This flexibility acknowledged that **no single order of knowledge** is absolutely fixed.

5. Notation
Bliss's view of notation was practical and minimalist:

- It should be **correlative** (reflecting relationships), **subsidiary** (a tool, not the system itself), and **simple**.
- He preferred **brevity** — ideally only **three to four digits** per class number.
- Supported **synthetic notation** — combining symbols economically for clarity and usability.

Bliss achieved a balanced, readable, and logical notation system that made his **Bibliographic Classification** both scholarly and serviceable.

259.2 Significance of Bliss's Contribution

- Provided **philosophical and logical justification** for class structure.
- His work **stabilized classification** by aligning it with the natural and educational consensus of knowledge.
- Introduced **flexibility** (alternative locations) and **relational design** (collocation), which bridged rigid and practical classification needs.
- Elevated librarianship from a craft to a **scholarly discipline**.

260. S. R. Ranganathan (1892 – 1972)

Ranganathan's work marks the **transition from descriptive to dynamic theory**.
His *Prolegomena to Library Classification* (1937) synthesized and expanded on earlier thinkers, laying down a **scientific framework** for classification.

He introduced an elaborate set of **laws, canons, postulates, and principles**, turning classification into a **systematic, evolving science**.
His ideas form what is now called the **General or Dynamic Theory of Library Classification.**

(→ Detailed discussion of his dynamic theory continues in the next section, 3.4.)

261. Classification Research Group (CRG), London

The **Classification Research Group (CRG)** was established in 1952 after the **Royal Society Scientific Information Conference (1948)**, on the suggestion of **J. D. Bernal**.

Nature and Membership:

- An **independent group of volunteers**, meeting regularly in London.
- Included **D. J. Foskett, B. I. Palmer, B. C. Vickery, A. J. Wells**, and others.
- Strongly influenced by **Ranganathan's work** on facet analysis.

261.1 Main Contributions

1. **Facet Analysis:**
   Adopted Ranganathan's concept but modified his five fundamental categories into **Entities, Properties, and Activities.**
   This allowed for flexible analysis without restricting the number of facets.
2. **Manifesto (1955):**
   Published in *Library Association Record* — argued that **faceted classification** should be the basis of all information retrieval systems.

3. **Specialized Schemes:**
   Designed faceted systems for subjects like *Soil Science, Diamond Technology, Music, Education,* and *Garment Technology.*

4. **PRECIS System:**
   Developed by **Derek Austin** (a CRG member) — *Preserved Context Indexing System* (1971) — which replaced Ranganathan's *Chain Procedure* in the *British National Bibliography*.

5. **Theory of Integrative Levels:**
   Proposed by later CRG members — arranged entities by increasing **complexity and interdependence** (used later in information systems and subject analysis).

6. **Collaborative Work:**
   Published *Sayers Memorial Volume* (1961) and organized the **International Conference on Classification Research (Dorking, 1957)** — both milestones in classification research.

261.2 Legacy and Impact

- Never produced a complete general scheme, but their **methods shaped modern KO research**.
- Brought **classification closer to information retrieval theory**.
- Inspired later developments in **metadata, thesauri, and ontologies.**
- Their ongoing revisions of the **Bibliographic Classification (BC2)** still reflect CRG's foundational influence.

262. Dynamic Theory — short summary
Ranganathan's **dynamic theory** (presented fully in *Prolegomena*, 1957; enlarged 1967) is a methodology for designing classification schemes that *grow* with knowledge. Its purpose: map the multi-dimensional universe of knowledge into a usable, one-dimensional scheme **without disturbing existing order** — i.e., a futuristic, extendible framework.

Examples:

1. Adding a new sub-discipline (e.g., *bioinformatics*) without reordering existing biological sciences.
2. Representing a compound topic (e.g., *history of medical ethics in India*) by analytico-synthetic construction rather than forcing a single fixed slot.
3. Interpolating a sudden growth area (e.g., *quantum computing*) into a technology schedule in the middle of existing entries

263. Three Planes of Work (Idea, Verbal, Notational)
Ranganathan split classification work into three separable planes so each could be handled without interfering with others:

- **Idea Plane** — pure concepts and their logical relations (what the subject *is*).
  Example: Deciding that *nanomaterials* is a sub-concept of *materials science*.
- **Verbal Plane** — words and terms used to express ideas (how you name the concept).
  Example: Choosing between the labels *e-health* vs *electronic health*.
- **Notational Plane** — symbols/numbers used to represent classes (how you show it on the shelf).
  Example: Assigning a class number like 612.02 or a facet string Q:PHYS + T:TI.

Separation prevents verbal ambiguity (homonyms/synonyms) from contaminating the pure Idea Plane, and lets notation evolve independently.

264. Basic Laws (six) — essence and micro-examples
These govern general thinking when other rules conflict:

1. **Law of Interpretation** — prefer the most appropriate meaning for context.
   Example: Interpreting "Java" as programming language in a computer science collection.
2. **Law of Impartiality** — don't let subjective bias order knowledge.
   Example: Not privileging one national viewpoint in world history arrangement.
3. **Law of Symmetry** — treat coordinate classes symmetrically.
   Example: If you give Physics a class, do likewise for Chemistry.
4. **Law of Parsimony** — prefer simpler structures when equal.
   Example: Use a single composite notation rather than many redundant subdivisions.
5. **Law of Local Variation** — allow local (institutional) adaptations.
   Example: A medical library adapting the order of nursing topics to its curricula.
6. **Law of Osmosis** — allow ideas to flow between neighbouring classes to improve helpfulness.
   Example: Placing allied therapy materials near clinical medicine so users discover related items

265. Five Laws of Library Science — role in classification
Ranganathan's famous five laws (1931) act as higher-order tiebreakers when canons conflict:

1. Books are for use.
2. Every reader his/her book.
3. Every book its reader.
4. Save the time of the reader.
5. A library is a growing organism.

Examples of invocation:

- When two placements are equally defensible, choose the one that *saves the reader's time* (Law 4).
- If literature grows rapidly on a topic, create a separate class (Law 5).

266. Postulates for Facets & Fundamental Categories (PMEST)
Ranganathan's core: **five fundamental categories** — **P**ersonality, **M**atter, **E**nergy, **S**pace, **T**ime (PMEST). Any subject can be analysed into facets drawn from these categories.

Examples (PMEST breakdown):

1. *History of Indian science in the 19th century, focusing on chemistry* → P: *science (chemistry)*; M: *chemical substances*; E: (methods/experiments) ; S: *India*; T: *19th century*.
2. *Urban transportation planning (case: Delhi, 2010–2020)* → P: *transport planning*; M: *modes of transport*; E: *policy measures*; S: *Delhi*; T: *2010–2020*.
3. *Clinical trials of a drug* → P: *clinical trial (personality)*; M: *drug molecule*; E: *trial procedures/therapeutic actions*; S/T as needed.

Ranganathan also allowed **rounds** and **levels** (a category can appear more than once at different granularities).

267. Facet Sequence & its guiding principles
The five categories have a recommended **PMEST** sequence (decreasing concreteness). Ranganathan gave four principles to order facets in a compound subject:

1. **Wall-Picture Principle** — choose an arrangement that gives the user the clearest "picture" of the subject as a whole.
   Example: For *economic history of India, 1850–1950*, show economy (Personality) first, then region (Space), then time (Time) so the user sees context.
2. **Whole-Organ Principle** — sequence facets like the organization of a whole organism (functional relation).
   Example: In *parts of a machine*, order from whole → part → function.
3. **Cow-Calf Principle** — put the major (cow) before its dependents (calves).
   Example: Physics (cow) before *solid state physics* (calf).
4. **Act–Action–Actor–Tool Principle** — order verbs and agents to preserve clarity in processes.
   Example: Teaching (act) – methods (action) – teacher (actor) – textbook (tool).

268. Principles of Helpful Sequence (selection)
Ranganathan listed eight broad principles to make arrays (coordinate lists) useful. A compact selection with examples:

- **Later-in-Time:** put later developments after earlier ones.
  Example: Put *post-1990 software engineering* after *earlier paradigms*.
- **Spatial Contiguity:** place geographically neighbouring regions together.
  Example: Group *Punjab* next to *Haryana* materials.
- **Increasing Complexity:** order items from simple to complex.
  Example: Introductory calculus → multivariable calculus → measure theory.
- **Literary Warrant:** prioritize topics by amount of literature.
  Example: Give a separate class to *climate change* when literature volume warrants it.
- **Alphabetical Sequence:** default last resort for otherwise equal items.

(There are more sub-principles — vertical, horizontal, radial, clockwise — used when arranging spatial or thematic arrays.)

269. Canons of Classification — three groups and examples
Ranganathan grouped **43 canons** into:

- **Idea Plane (15)** — govern selection and sequence of characteristics and arrays.
  Example canon: classes in an array must be *collectively exhaustive and mutually exclusive* — e.g., chemical elements vs compounds must be clearly separated.
- **Verbal Plane (4)** — govern terminology (context, currency, enumeration, reticence).
  Example canon: apply the **Canon of Context** by ensuring "card" means index card in library context, not playing card.
- **Notational Plane (24)** — notation rules (basic canons, mnemonics, hospitality/growing universe, book classification).

Example canon: **Hospitality in array** — notation must allow interpolation (insert new items in middle).

270. Notation: features & devices
Key notational concepts Ranganathan emphasized:

- **Hospitality (in array & chain):** ability to interpolate/extrapolate.
  Example: Using emptying digits to leave room for future entries.
- **Mnemonics:** several types (alphabetical, scheduled, systematic, seminal).
  Example: Systematic mnemonics where similar subjects have related numbers.
- **Co-extensive vs Non-co-extensive numbers:** whether notation completely represents the concept extent.
- **Emptying digits (T–Z in later CC versions):** reserve slots for interpolation.

Practical examples:

1. Use 500 family for sciences and leave 505.0–505.9 for future subdivisions (hospitality).
2. Faceted notation like Q:PHYS . M:THERMO where punctuation separates facets (analytico-synthetic).

271. Colonial (Colon) Classification — application
Ranganathan's **Colon Classification** (CC) became the prime vehicle for testing the dynamic theory:

- Early editions were stricter; from 4th ed. (1952) onward CC became **freely faceted analytico-synthetic**.
- Concepts like **facet analysis, PMEST, rounds/levels, hospitality**, and **wall-picture** were implemented practically.

Examples of CC use:

1. Building a book number by concatenating facets: Class : Personality . Matter . Energy . Space . Time.
2. Using notation conventions (commas, colons) to mark facet boundaries and life indicators.

272. Later refinements (selected technical advances)
Between 1957–1967 and beyond, Ranganathan and later editors refined CC and theory:

- Re-interpretation of some isolates as **Matter-Property** instead of Energy.
- Prescription of **life indicator comma** before Personality isolates.
- Restoration of 0 (zero) to ordinal role and use of Roman letters' anteriorising quality being changed.
- Use of **emptying digits** (T–Z) to make interpolation simpler.

Example: these refinements allowed smoother insertion of new specialties in mid-arrays without renumbering large parts of the schedule.

273. Legacy and contemporary relevance
Ranganathan's dynamic theory:

- Turned classification from art to **methodical science**.
- Gave durable tools (facet analysis, PMEST, hospitality) that underpin modern KOS, metadata schemas, and faceted search interfaces.

- Influenced CRG and later developments in ontologies, thesauri, and IR systems.

Contemporary examples of influence:

1. Faceted navigation on e-commerce sites (category / brand / price / color) parallels facet analysis.
2. Metadata schemas that separate conceptual, lexical, and identifier layers mirror Idea/Verbal/Notational planes.
3. Thesaurus construction and controlled vocabularies still use literary warrant and helpful sequence principles.

274. Quick practical checklist (when designing or revising a schedule)

1. Work first in the **Idea Plane** — define concepts and relations.
2. Fix **verbal terms** clearly (canonical, non-ambiguous).
3. Design **notation** with hospitality and mnemonic aids.
4. Apply **PMEST** to break compound subjects into facets.
5. Order facets using **Wall-Picture** + helpful sequence rules.
6. Test with **literary warrant** — does the literature justify a separate class?

Examples to test: take *blockchain in healthcare*, *gender studies in literature*, *nanorobotics for drug delivery* — practice facet analysis and assign tentative notations.

Dynamic Theory of Library Classification (Ranganathan & Parkhi)

Aspect / Topic	Description / Explanation	Key Points / Examples
1. Concept of Dynamic Theory	Proposed by **R.S. Parkhi**, it is a theory of library classification that provides a **methodology for designing** a classification scheme. It allows incorporation of **new subjects** without disturbing the existing order.	- Regarded as **Stage-2** in the General Theory of Library Classification. - Approach: **Futuristic and adaptable.**
2. Development of the Theory	Developed by **S.R. Ranganathan (1948–1955)**. First appeared in the **2nd edition** of *Prolegomena to Library Classification* (1957); refined in the **3rd edition (1967)**.	- Provided a **stable methodology** for designing classification schemes. - Helped adapt to the **expanding universe of knowledge.**
3. Three Planes of Work	Ranganathan separated classification work into three planes to ensure clarity and efficiency.	**Idea Plane**: Conceptual analysis of subjects. **Verbal Plane**: Terminology and vocabulary. **Notational Plane**: Symbols and notation.
4. Significance of Separation	Earlier, confusion between terminology and ideas hindered classification work. The separation clarified each plane's role and removed dependency.	- Highlighted **Idea Plane's primacy**. - Allowed **independent development** of each plane.

5. Additions by 1963	Ranganathan refined the theory with further innovations.	i) Recognition of **Property isolates** (Matter-Property).
		ii) Use of **comma (,)** before Personality isolate.
		iii) Expanded **notational capacity** (using digits and letters).
		iv) Added **Emptying Digits (T–Z)** for interpolation.
		v) Developed **18 principles of helpful sequence** and the **Wall-Picture Principle**.
6. Impact on Colon Classification	Incorporated in **Colon Classification (Version 3 / 7th Edition)**.	Made it a **Freely Faceted Analytico-Synthetic Scheme**—flexible and modern.
7. Ranganathan's Broader Contribution	He revolutionized library classification through laws, canons, and postulates.	Advocated **Facet Analysis** and **Fundamental Categories (PMEST)**. Rejected purely **enumerative schemes**.
8. Basic Laws (6)	Guiding laws for theoretical consistency in classification.	1. Law of Interpretation
		2. Law of Impartiality
		3. Law of Symmetry
		4. Law of Parsimony
		5. Law of Local Variation
		6. Law of Osmosis
9. Five Laws of Library Science (1931)	Core principles guiding library practice and classification.	1. Books are for use.
		2. Every reader his/her book.
		3. Every book its reader.
		4. Save the reader's time.
		5. Library is a growing organism.
10. Postulates for Facets (PMEST)	Framework for analyzing subjects.	Five **Fundamental Categories**:
		- **Personality (P)**
		- **Matter (M)**
		- **Energy (E)**
		- **Space (S)**
		- **Time (T)**
11. Facet and Round Concepts	Categories may repeat within a subject (called "Rounds").	- **Energy** may manifest multiple times.
		- **Personality** and **Matter** can have multiple **levels**.
12. Principles of Facet Sequence (4)	Guide order of facets within subjects.	1. Wall-Picture Principle
		2. Whole-Organ Principle
		3. Cow-Calf Principle
		4. Actand Action-Actor-Tool Principle
13. Principles of Helpful Sequence (8 main + subtypes)	Guide arrangement of subjects and isolates for logical, helpful order.	Includes: Later-in-Time, Later-in-Evolution, Spatial Contiguity, Increasing Quantity, Complexity, Canonical, Literary Warrant, Alphabetical Sequence, etc.
14. Canons of Classification (43 total)	Rules ensuring clarity and logical structure. Grouped into three planes:	**Idea Plane (15)** – Characteristics, Arrays, Chains, Filiatory Sequence.
		Verbal Plane (4) – Context, Enumeration, Currency, Reticence.

		Notational Plane (24) – Basic, Mnemonics, Growing Universe, Book Classification.
15. Notational Innovations	Ranganathan improved notational systems to handle growth.	- **Hospitality in array/chain** (accommodating new subjects).
		- **Mnemonics**: alphabetical, scheduled, systematic, seminal.
16. Role of Postulates, Canons, and Principles	They provide structure and rhythm to classification.	- **Postulates**: Govern idea plane.
		- **Canons**: Govern structure and order.
		- **Principles**: Govern detailed arrangement.
17. Overall Impact	Formed the **Dynamic Theory**—a foundation for modern faceted classification.	Applied in **Colon Classification (4th ed., 1952 onward)** → Freely faceted, flexible, and evolving system.

Other Format for revision:

Aspect / Topic	Description / Explanation	Key Points / Examples
1. Meaning of Normative Principles	These are **guiding scientific principles** that form the foundation of classification theory and practice. They ensure a systematic and logical design of classification schemes.	- Serve as **scientific guidelines**.- Used for designing, analyzing, comparing, and interpreting classification schemes.- Help classifiers in daily work and theoretical development.
2. Purpose / Functions	Normative principles help in:	1. Designing and remodeling schemes.2. Critically studying existing schemes.3. Comparing different classification systems.4. Interpreting rules and schedules.5. Guiding classifiers in daily work.6. Providing scientific grounding for theory.
3. Terminology Convention (Ranganathan)	Ranganathan used specific terms for normative principles at different **levels of work**.	
Level	**Term Used**	**Context / Application**
Basic Process of Thinking	**Basic Laws**	Universal principles of logic and reasoning.
Library Science as a Discipline	**Fundamental Laws**	Core philosophy of librarianship.
Classification	**Canons**	Rules for designing and applying classification systems.
Helpful Sequence in Array	**Principles**	Guidelines for logical order of classes.
Work of Classifying (Facet Work)	**Postulates and Principles**	Used for arranging and sequencing facets.

4. Basic Laws (Six) Formulated by **S.R. Ranganathan** as universal guiding principles for classification thought.	
Law	**Description / Example**
1. Law of Interpretation	Apply logical interpretation to resolve conflicts between rules, canons, and principles — like interpreting legal texts. Example: Used for revising or improving *Colon Classification*.
2. Law of Impartiality	No arbitrary preference between competing claims (e.g., between facets or users). Example: Use **Wall-Picture Principle** uniformly across subjects for facet order.

3. Law of Symmetry	If two entities are symmetrical, both should receive equal treatment. Example: Equal ordinal value between notations such as Roman letters and Indo-Arabic numerals.	
4. Law of Parsimony	Prefer the simplest, most economical approach (saves time, money, effort). Example: Reclassify only frequently used parts of a collection.	
5. Law of Local Variation	Allow for **local adaptations** to meet specific community or regional needs. Example: Creating special collections for Indian, regional, or institutional interests.	
6. Law of Osmosis	Change (e.g., reclassification) should be gradual and economical. Maintain **two systems** temporarily to ease transition. Example: Keep old and new catalogues during migration to a new classification scheme.	
5. Fundamental Laws (Five Laws of Library Science)	Proposed by **Ranganathan (1931)** — the philosophical base of all library science.	1. Books are for use. 2. Every reader his/her book .3. Every book its reader. 4. Save the reader's time. 5. Library is a growing organism.

6. Canons of Classification

"Canons" = rules or standards for designing and applying schemes. Ranganathan identified **three planes of work**, each with its own canons.

Plane	Purpose	Main Canons / Examples
Idea Plane	Deals with analyzing knowledge structure and its logical division.	(a) Canons for Characteristics (e.g., differentiation, relevance) (b) Canons for Succession of Characteristics (c) Canons for Array (d) Canons for Chain (e) Canons for Filiatory Sequence
Verbal Plane	Deals with terminology and naming consistency in schedules.	(a) Canon of Context (b) Canon of Enumeration (c) Canon of Currency (d) Canon of Reticence
Notational Plane	Deals with symbolic representation of ideas (notations).	(a) Canon of Synonym and Homonym (b) Canon of Relativity and Uniformity (c) Canon of Hierarchy / Non-hierarchy (d) Canon of Mixed / Pure Notation (e) Canon of Faceted / Non-faceted Notation (f) Canon of Co-extensiveness / Under-extensiveness
Canons for Growing Universe	Allow expansion and accommodation of new knowledge.	(a) Canon of Extrapolation in Array/Chain (b) Canon of Interpolation in Array/Chain
7. Helpful Sequence in Array	Guides **logical and user-friendly arrangement** of entities (classes or isolates).	Sequence should be **helpful to majority of users**; may vary by context (time, geography, quantity, etc.).
Principles for Helpful Sequence		**Examples:** 1. **Time Sequence** – Later/Earlier in Time. 2. **Evolutionary Sequence** – Later/Earlier in Evolution. 3. **Spatial Contiguity** – Adjacent areas grouped together. 4. **Quantity** – Increasing or Decreasing. 5. **Complexity** – Increasing or Decreasing Simplicity. 6. **Canonical Sequence** – Traditional order. 7. **Literary Warrant** – Based on subject prevalence in literature.

		8. **Alphabetical Sequence** – Useful for mixed topics.
8. Postulates and Principles for Facet Sequence	Used during **practical classification of subjects** and design of schemes. Postulates are "assumptions" guiding how subjects are broken down and arranged.	**Main Postulates:** a) For freely faceted classification. b) For fundamental categories (PMEST). c) For basic facet. d) For isolate facet. e) For rounds and levels .f) For rounds of energy. g) For facet sequence.
9. Principles for Facet Sequence	When postulates aren't enough, these principles guide the **order among facets of the same type** (e.g., two Matter or two Energy facets).	a) Wall-Picture Principle. b) Whole-Organ Principle. c) Cow-Calf Principle.d) Commodity–Raw Material Transformation Principle. e) Actand–Action–Actor–Tool Principle.
10. Overall Importance	The entire framework — laws, canons, principles, postulates — gives **library classification a scientific foundation**.	- Ensures **consistency**, **flexibility**, and **growth** in schemes .- Forms the core of **Ranganathan's Dynamic Theory of Classification**.

275. Subject Heading — Definition (short)
A **subject heading** is a word or phrase used in catalogues, indexes or bibliographies to express the theme or topic of a document. It functions as a compact, controlled summary of what a work is about and is the authorized form under which works on that topic are grouped in a catalogue.

Examples:

1. *Climate change* as a subject heading for books on global warming.
2. *Machine learning (Computer science)* to distinguish from general "learning."
3. *Shakespeare, William — Criticism and interpretation* for literary criticism.
4. *Diabetes — Treatment* for medical treatment texts.

276. Methods of Deriving Subject Headings — practical steps
To assign an accurate subject heading the cataloguer must determine the true subject of the work by investigation rather than by title alone. Typical procedure:

1. Read the **title page** and subtitle carefully.
2. Consult the **table of contents**, preface, introduction and index to identify scope and emphasis.
3. Skim or read relevant portions of the text when needed to resolve ambiguity.
4. For non-book media inspect packaging, labels or guides and, if possible, view or listen to content.
5. Consult **reference sources** (dictionaries, encyclopedias, thesauri, subject reference works) for technical terms or ambiguous concepts.

Examples of applying the method:

1. A title *"Networks"* → check TOC; assign *Computer networks* or *Social networks* depending on content.

2. A video labelled *"World War I"* → watch intro to decide whether its military history, social history, or propaganda—choose *World War, 1914–1918 — Social aspects* if emphasis matches.
3. A conference proceedings with diverse papers → derive separate headings per paper subject rather than one broad heading.
4. A handbook titled *"Practical Pharmacy"* → examine chapters to prefer *Pharmacy — Practices* over generic *Pharmacy*.

277. Principle of Specific and Direct Entry (Cutter)
Enter a work under the **most specific subject heading that accurately represents its content**, not under a broader class. This ensures precision and helps users find the exact material they need.

Examples:

1. Use *Systems librarians* (specific) rather than *Librarians* (broad).
2. Use *Renewable energy — Solar power* instead of *Energy* when solar focus dominates.
3. Use *E-commerce — Security* not simply *E-commerce* if security is the main subject.
4. Use *Urban transport — Delhi* rather than *Urban transport* for a Delhi case study.

278. Printed List of Subject Headings & Authority Control (short)
A **printed/maintained list of subject headings** (authority file) provides authorized forms, cross-references and scope information to ensure consistency across catalogues. The Subject Authority File contains subject authority records created when a heading is established; maintaining this file is **subject authority control**.

Examples of what an authority record may include:

1. Authorized heading: *Internet (Computer network)*.
2. See-from references: *Cyberspace → see Internet (Computer network)*.
3. Scope note: clarifying the heading covers technical/network aspects, not cultural.
4. Variant forms: *World Wide Web* as cross-reference to *Internet (Computer network)*.

279. Principles for Formulating Subject Headings (LSH) — concise list

1. **Literary Warrant:** choose terms that reflect the terminology used in current literature — only create headings supported by published literature.
   Example: Establish *Climate migration* when sufficient literature exists.
2. **Uniform Heading:** prefer standard, contemporary language; avoid unnecessary jargon; provide cross-references from synonyms and variant forms.
   Example: Use *People with disabilities* rather than *Handicapped*; keep cross-ref from older term.
3. **Unique Heading:** each heading ideally represents one topic; ambiguous terms are qualified or subdivided (parenthetical qualifiers or subdivisions).
   Example: Mercury (Planet) vs *Mercury (Element)*.
4. **Specific Entry:** choose the most precise term co-extensive with the work's subject rather than a broader term.
   Example: Bait fishing as heading if the work is on bait techniques rather than generic fishing.

5. **Consistency:** maintain predictable form and structure across headings so users can anticipate patterns; revise bibliographic records when headings change.
   Example: Consistent use of chronological subdivisions: *—History—20th century*.
6. **Dynamism (currency):** headings are continually revised to remain current; changes are balanced against authority file impact.
   Example: Handicapped → People with disabilities; *Machine-readable dictionaries → Electronic dictionaries*.
7. **Pre-coordination vs Post-coordination:** LSH is primarily **pre-coordinate** (compound headings anticipated and created), but sometimes requires **post-coordination** by the searcher (combining headings at search time).
   Example pre-coordination: Furniture design — France — History — 20th century;
   Post-coordination: searching *Architecture, Roman + Great Britain* to retrieve a specific study.

280. Practical guidance & pitfalls for subject heading assignment

- **Always verify literary warrant** before creating a new authorized heading.
- **Prefer neutral, inclusive language**; add scope notes where ambiguity exists.
- **Use qualifiers** (parenthetical or subdivisions) to disambiguate homonyms.
- **Avoid over-splitting** into headings so narrow they won't be retrieved; balance specificity with likely user search behaviour.
- **Update records** when authority headings are revised to preserve retrieval integrity.

Examples of pitfalls:

1. Relying on title alone (leads to miscategorizations).
2. Creating a very narrow heading with negligible literature (won't help users).
3. Failing to add see-from references for common synonyms (users miss authorized forms).
4. Changing headings without updating bibliographic records (breaks consistency).

281. Types of List of Subject Headings – Overview

The practice of assigning standardized subject headings began in the late 19th century as a way to bring **consistency** and **predictability** to subject cataloguing.
The earliest known contribution came from **Crestadoro**, who in *The Art of Making Catalogues* first proposed giving books standardized subject terms.

Later, in **1895**, the **American Library Association (ALA)** published the *List of Subject Headings for Use in Dictionary Catalogues*, mainly guided by **Charles A. Cutter's** principles. This was followed by two more editions (1898 and 1911).

When the **Library of Congress** began publishing its own subject heading list, the ALA version was discontinued.

Today, two standardized lists dominate international practice:

1. **Library of Congress Subject Headings (LCSH)**
2. **Sears List of Subject Headings (SLSH)**

282. Library of Congress Subject Headings (LCSH)

8.1 History

Origin and Development:

- The **Library of Congress Subject Headings (LCSH)** originated in **1898**, based on the **ALA List of Subject Headings** (1895).
- **First printing (1909–1914)** appeared as *Subject Headings Used in the Dictionary Catalogues of the Library of Congress*.
- **5th edition (1948)** introduced "refer-from" references for cross-linking related topics.
- **6th edition (1957)** adopted a three-column page format that remained standard until 1999.
- By **1975 (8th edition)**, LCSH took its modern name and was published in two volumes.
- **Microfiche version (1976)** appeared for computer-output microform (COM) catalogues.
- **1980s–1990s:** Development of electronic access formats—**CDMARC Subjects**, **MARC tapes**, and **FTP transfer** for utilities like OCLC and RLIN.
- **1991:** Formation of **SACO (Subject Authority Cooperative Program)**, allowing cataloguers worldwide to propose new subject headings.
- By **2012 (34th edition)**, LCSH included over **329,000 headings** and **8,000 new additions** in six volumes ("Red Books").

Significance:
LCSH remains the **most comprehensive and authoritative** subject heading list worldwide, ensuring uniform subject access across millions of records.

283. Structure of LCSH

LCSH organizes subject terms into **three general categories**:

1. **Topical Headings** – Represent specific subjects, phenomena, disciplines, or processes.
    - Examples: *Physics*, *Environmental ethics*, *Buddhism*, *Public libraries*, *Artificial intelligence.*
2. **Form/Genre Headings** – Indicate what a work *is*, rather than what it is *about*.
    - Examples: *Encyclopedias*, *Handbooks, manuals, etc.*, *Short stories (American)*, *Maps*.
3. **Name Headings** – Used for works about people, places, or organizations.
    - **Personal names:** *Shakespeare, William — Criticism and interpretation.*
    - **Corporate names:** *United Nations — History.*
    - **Geographic names:** *India — Economic conditions.*
    - **Titles:** For works about specific texts, e.g., *Bible — Genesis — Criticism, interpretation, etc.*

284. Subdivisions in LCSH

Subdivisions refine a main heading to make it more **specific**. They are combined with headings to express detailed concepts or aspects of a topic.

8.3.1 Topical Subdivisions

Show aspects or parts of a subject.
Examples:

- *Construction industry — Management.*
- *Airplanes — Cockpits.*
- *Library resources — Data processing.*
  Each added subdivision increases specificity: *Construction industry — Management — Employee participation.*

8.3.2 Geographic Subdivisions

Limit a subject to a specific region or locality.
Examples:

- *Income tax — Brazil.*
- *Subways — Korea (South) — Seoul.*
- *Stone carving — Cambodia — Angkor (Extinct city).*
- *Economic assistance, Scandinavian — Africa.*

8.3.3 Chronological Subdivisions

Indicate time periods covered by the work.
Examples:

- *Japan — History — Tokugawa period, 1600–1868.*
- *United States — History — Civil War, 1861–1865.*
- *French poetry — 19th century.*
- *World politics — 1919–1932.*
- *Medicine, Medieval* (as adjectival qualifier).

8.3.4 Form Subdivisions

Show *what the item is*, not what it's about — describe format or presentation.
Examples:

- *Engineering — Indexes.*
- *Sociology — Congresses.*
- *Vegetable gardening — Handbooks, manuals, etc.*
- *Porcelain, Chinese — Catalogues.*
- *Singapore — Guidebooks.*
- *Sports — Juvenile humor.*

285. Key Features and Functions of LCSH

1. **Pre-coordination:** Combines multiple elements into a single heading string before searching.
   Furniture design — France — History — 20th century — Exhibitions.

2. **Cross-references:** Provides *see* and *see also* references to connect synonyms and related topics.
   Handicapped persons → See: People with disabilities.
3. **Authority Control:** Uses a **Subject Authority File** to maintain consistency and handle heading changes across databases.
4. **Cooperation:** Through programs like **SACO**, libraries worldwide contribute to heading creation and refinement.
5. **Digital Integration:** LCSH data are accessible through **MARC 21**, **OCLC**, and **linked data vocabularies**, enabling global cataloguing uniformity.

286. Sears List of Subject Headings (brief preview)

(To follow after LCSH)

The **Sears List of Subject Headings (SLSH)**, designed for small and medium libraries, simplifies LCSH's complexity while retaining its logic. It emphasizes:

- Common vocabulary.
- Adaptability.
- Simpler syntax and reduced pre-coordination.
- Educational orientation for school and public libraries.

287. Sears — history (short & sharp)
Minnie Earl Sears first published the *List of Subject Headings for Small Libraries* in **1923**. Over subsequent editions the list: dropped "for Small Libraries," adopted LC-style reference symbols (x, xx → UF, SA), added DDC numbers, expanded treatment of children's literature and nonbook materials, and modernized headings for globalization and technology. Major editorial updates occurred in **1933, 1944, 1959, 1986, 1991, 1997, 2000, 2004,** and the **2010 (20th) edition**, which added hundreds of contemporary headings (e.g., *Climate change*, *Twitter (Web site)*, *Graphic novels*).

Examples of changes introduced across editions:

1. Addition of see-also references (2nd ed.).
2. Inclusion of DDC numbers (4th ed.).
3. Simplification and uninversion of headings (1991).
4. Large topical expansion for modern subjects (2010).

288. Types of subject headings in Sears (four types)

1. **Topical headings** — name concepts or subjects.
   - Examples: *Forests*, *Climate change*, *Machine tools*.
2. **Form headings** — indicate what the item *is* (genre/format).
   - Examples: *Handbooks, manuals*, *Atlases*, *Biographical films*.
3. **Geographic headings** — places as subjects or qualifiers.
   - Examples: *Chicago (Ill.)*, *Ohio*, *United States — History*.
4. **Name headings (proper names)** — personal, corporate, uniform titles.

- Examples: *Clinton, Bill, 1946-*, *United Nations*, *Gone with the wind (Motion picture)*.

(Use literary warrant and standard references when creating geographic or name headings not in the list.)

289. Forms (grammar) of headings — how they're built

1. **Single nouns** — disciplines, abstract ideas, or countables.
   - Examples: *Biology*, *Existentialism*, *Playgrounds*, *Steel*.
2. **Compound headings** — two nouns joined by "and" to express one concept or relationship.
   - Examples: *Bow and arrow*, *Church and state*, *Publishers and publishing*.
3. **Adjective + noun** — direct natural-language order preferred (uninverted).
   - Examples: *Unemployment insurance*, *Buddhist art*.
4. **Phrase headings** — longer, sometimes awkward phrases when no compact term exists.
   - Examples: *Insects as carriers of disease*, *Violence in popular culture*.

Tip: modern Sears favors direct ordering (Adjective + Noun) over historical inversion.

290. Subdivisions in Sears — four main kinds

1. **Topical subdivisions** — refine aspect or viewpoint.
   - Example: *Clothing and dress — History*; *Mathematics — Study and teaching*.
2. **Geographic subdivisions (direct form)** — limit topic by place.
   - Example: *Bridges — France*; *Italian art — Great Britain*.
3. **Chronological subdivisions** — indicate time periods.
   - Example: *United States — History — 1600–1775, Colonial period*.
4. **Form subdivisions** — describe what the item *is* under a topical heading.
   - Example: *Children's literature — Bibliography*; *Geology — Maps*.

Rule of thumb: don't subdivide geographically when the heading itself functions as a subdivision (e.g., *Exploration* used under place headings).

291. Problem areas & application notes (practical)

1. **Biography**
   - *Collective biographies* → topical headings (e.g., *Leaders of the Arab World* → *Arab countries — Biography*).
   - *Individual biographies* → personal name heading with subdivisions (e.g., *Shakespeare, William — Criticism and interpretation*).
2. **Literature**
   - Works *about* literature → topical heading with history/criticism subdivisions (e.g., *Poetry — History and criticism*).
   - Individual creative works → assigned form headings (e.g., *Poetry — Collections*).
3. **Nonbook materials**

- Apply the same topical headings as for books; avoid adding physical-format form subdivisions under topical headings (use form headings instead).
- Example: A film about jazz → topical heading *Jazz* + form heading *Biographical films* (not *Jazz — Motion pictures*).

292. Making references — three types & how they help users

1. **See references** (UF / Used for) — point from non-preferred/variant terms to the authorized heading.
   - Example: *Handicapped* → See *People with disabilities*.
2. **See also references** (SA) — link related authorized headings to broaden discovery.
   - Example: Under *Clothing and dress* → SA: *types of clothing articles (to be added as needed)*.
3. **General references (SA to a category)** — cue the cataloguer to create headings as needs arise and guide subdivision use.
   - Example: *Flowers* → SA: *See also types of flowers (Day lilies, Orchids, Roses ... to be added as needed)*.

Practical rule: add references based on user vocabulary and local collection needs.

293. Maintaining a catalogue — essentials

- Catalogues are living instruments: add records, revise headings, and maintain references to preserve retrieval.
- Authority control (subject authority file) is central — create and update subject authority records when new headings or references are established.
- Balance currency (changing language and new topics) with stability (avoiding disruptive wholesale changes).

Examples of maintenance actions:

1. Creating a subject authority record when *Climate migration* first appears in the collection.
2. Replacing *Handicapped* with *People with disabilities* and adding UF cross-references.
3. Adding SA/BT/NT links so users searching synonyms are guided to the authorized term.

294. Compact glossary (useful quick terms)

- **Authority control:** Establishing and maintaining consistent forms (names, subjects, titles).
- **BT (Broader term):** Superordinate idea.
- **NT (Narrower term):** Subordinate idea.
- **RT (Related term):** Conceptually related term.
- **UF (Used for):** Non-preferred terms that point to the authorized heading.
- **SA (See also):** General or cross references to other headings or categories.
- **Subject authority file:** Collection of subject authority records.
- **Subject authority record:** Record describing a single authorized subject heading and its references.